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AML RECLAMATION  
DIVISION OF NATURAL RESOURCES

Navajo Nation Archaeology Department Report No. 92-146

An Archaeological Survey for the Proposed Reclamation of Nine Abandoned Uranium Mines in  
Cameron, Coconino County, Arizona

(NNAD-92-146)  
(CAMERON NAMLRD PROJECT 3)

by

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## Abstract

1. AGENCY: Navajo Nation Historic Preservation Department
2. PROJECT TITLE: An Archaeological Survey for the Proposed Reclamation of Nine Abandoned Uranium Mines in Cameron, Coconino County, Arizona.
3. PROJECT NUMBER: NNAD-92-146 (Cameron AML Project 3)
4. PROJECT DESCRIPTION: Navajo Abandoned Mine Lands Reclamation Department (NAMLRD) proposes to reclaim nine project areas identified as hazards to public health and safety. These proposed reclamation areas contain open uranium mine pits up to 75 feet deep; associated waste rock; and small piles of uranium protore. Heavy equipment, including bulldozers & scrapers, will be used to replace the protore and waste rock in the mine pits at each of the nine project areas.
5. LOCATION: The project area is in Cameron, Coconino County, Arizona within the Cameron and Chapter of the Tuba City Agency. All of the areas are located on Navajo Tribal Trust Land. The township and range is: T28N, R10E. For those areas which are unplatted, the projected township and range is T27N, R10E of the Gila and Salt River meridian. USGS 7.5 Minute maps are Cameron Southeast, Arizona 1988 Provisional Edition, and Wupatki Northeast, Arizona 1969.
6. NUMBER OF SURVEYED ACRES: 286.3 acres (115.8 hectares)
7. NUMBER OF SITES: Nine
8. NUMBER OF ELIGIBLE SITES: None
9. LISTING ELIGIBLE SITES: N/A
10. COMMENTS: None

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## INTRODUCTION

"The good Earth had plenty to give, but the traditions said it shouldn't be taken recklessly. Now they were taking it [uranium] by force. Many of the old [Navajo] people...had said that it would have a bad ending. For the Earth is sacred and needed its various parts intact to function as a provider for the human race, and all life" (Clark 1988:19). This project is a step in the reclamation of uranium mines that have been left open for at least 30 years in Cameron, Arizona.

In the western part of the Painted Desert, on Navajo Tribal Trust Land around Cameron, Coconino County, Arizona (Figures 1 and 2), an extensive area of scattered uranium deposits exists in the lower members of the Chinle Formation, which includes "(in ascending order) the Shinarump, sandstone and siltstone, Petrified Forest, and Owl Rock Members" (Scarborough 1981:32). The uranium deposits were prospected and mined during the 'uranium boom' of the 1950s and early 1960s. Rather intensive ore exploration and exploitation has left a legacy of landscape scars, radioactive protore piles (low grade ore, stock-piled for future use), and potentially dangerous ponds: open mining pits, some tens of acres in size, dot the barren landscape of the Painted Desert north and east of Cameron; water impounded in some of the pits creates murky pools which are used by livestock for drinking and at times by local children for swimming. Contamination of groundwater or the Little Colorado River by radioactive minerals poses an undetermined environmental risk.

In an effort to mitigate real and potential health and safety hazards, and abate the most severe and extensive surface disturbances, the Abandoned Mine Lands Reclamation Department (NAMLRD), Navajo Nation Division of Natural Resources, is proposing to reclaim many of the old uranium mines in the Cameron area. The third phase of this project involves the reclamation of nine project areas; other mines will be reclaimed as funds become available. As part of its effort to comply with federal and tribal legislation, NAMLRD requested that the Navajo Nation Archaeology Department at Northern Arizona University (NNAD-NAU) conduct an archaeological survey of the nine project areas prior to initiating any ground disturbing activity.

John O'Brien, NAMLRD Mining Engineer, accompanied Miranda Warburton, NNAD Archaeologist, on a preliminary inspection of the nine project areas in early March of 1992. The archaeological survey was conducted by Brady TwoBears, Davina Begaye, and Alfred Livingston of NNAD-NAU Branch Office on May 1, 4, 5, 13, and June 3, 1992. NAMLRD funded this study and provided detailed topographic maps for all project areas or uranium mines and some historic documentation. In addition to the archaeological survey, several individuals were interviewed about their participation in, or knowledge of, mining operations at Cameron, Arizona. This ethnohistorical inquiry was conducted by Grace Morgan of NNAD-NAU.

Figure 1. General Map Location of NNAD 92-146 (Goodman: 1982).

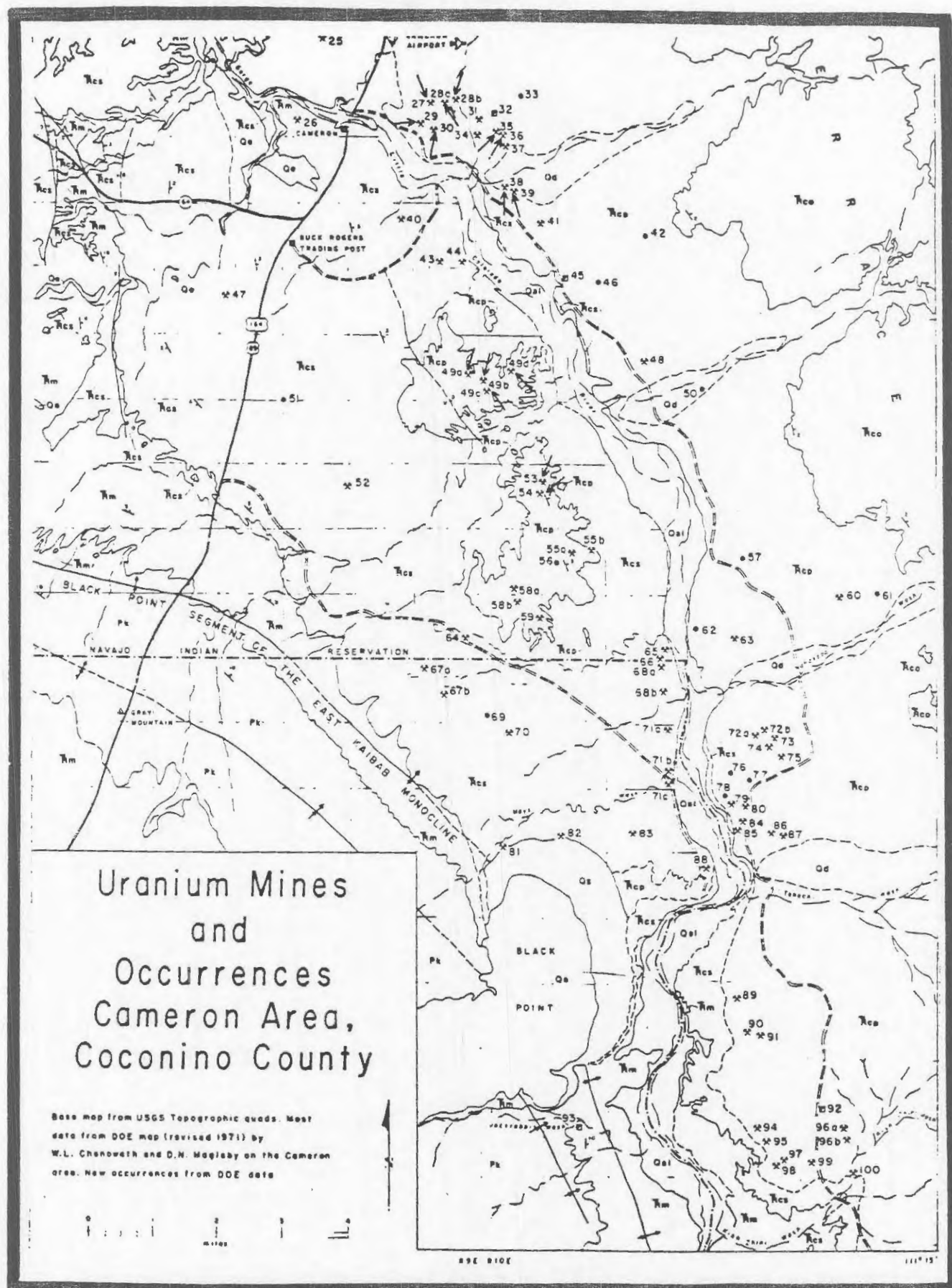


Figure 2. Topographic Map Illustrating the Location of Uranium Mines and Occurrences in the Cameron, Ariz. Region (Based on Cameron, AZ 15' Quad.



## PROJECT DESCRIPTION

NAMLRD proposes Cameron Project III to reclaim nine project areas identified as hazards to public health and safety. The proposed reclamation areas contain open mine pits up to 75 feet deep, associated waste pile, including overburden and small piles of protore. Heavy equipment (bulldozer, scrapers, etc.) will be used to put the protore and waste rock back into mine pits at each of the nine project areas. All project areas are accessed by existing roads that require little or no improvement.

The nine project areas proposed in the Cameron Reclamation Project III are listed in Table 1. Figures 3a, 3b, 3c show the specific locations of these areas on USGS topographic quadrangles. The size of the nine project areas vary from 7.5 acres to 105.8 acres. The total area of effect and area surveyed for the proposed project areas is 286.3 acres (115.8 ha). This acreage is based upon NAMLRD calculations.

## LOCATION

The nine project areas (PAs) of the Cameron Project III are located in the Coalmine Mesa and Cameron Chapters, Tuba City Agency, of the Navajo Nation, Coconino County, Arizona (Figures 1 and 2). All of the nine project areas are located on Navajo Tribal Trust Land.

Although portions of this region have not been included in a government survey, the projected township and range is T27N, R10E, while the unprojected township and range is T28N, R10E, of the Gila and Salt River meridian. Specific locations of the project areas are shown in Figures 3a-c on USGS 7.5 minute topographic quadrangles *Cameron Southeast*, 1988 Provisional Edition, *Wupatki Northeast*, 1969. Table 1 gives the UTM coordinates for the corner points (CPs) and approximate centers of the nine project areas.

## ENVIRONMENTAL & CULTURAL SETTING

The Painted Desert extends along the Little Colorado River from Holbrook north and west to Tuba City. It covers a broad arc across the southwestern portion of the Navajo Reservation from the Gap at the base of the Echo Cliffs to around Chambers east of the Petrified Forest National Park. The Painted Desert is essentially a vast expanse of colorful Triassic Period silt- and mudstone, intricately dissected and eroded to form badlands and low scarps. The Chinle Formation is the principal geologic unit exposed in the Painted Desert, and it is from this formation that uranium was mined.

The project area is located in the northwestern portion of the Painted Desert, and surrounds the northeast, south and southeast of Cameron, Arizona. It is drained by Hamblin and Moenkopi Washes and the Little Colorado River. In this area the resistant sandstone and conglomerate of the Shinarump Member and silt- and mudstone of the Petrified Forest Member are exposed: the former as ledges, scarps, and bedrock surfaces, the latter as badlands. Sediments for the area are either

Figure 3a. Specific USGS Map Location of AZ-N-11-06 (NAMLRD # 55 a,b)  
USGS 7.5' Name: Cameron SE, Arizona 1988 Prov. Edition.

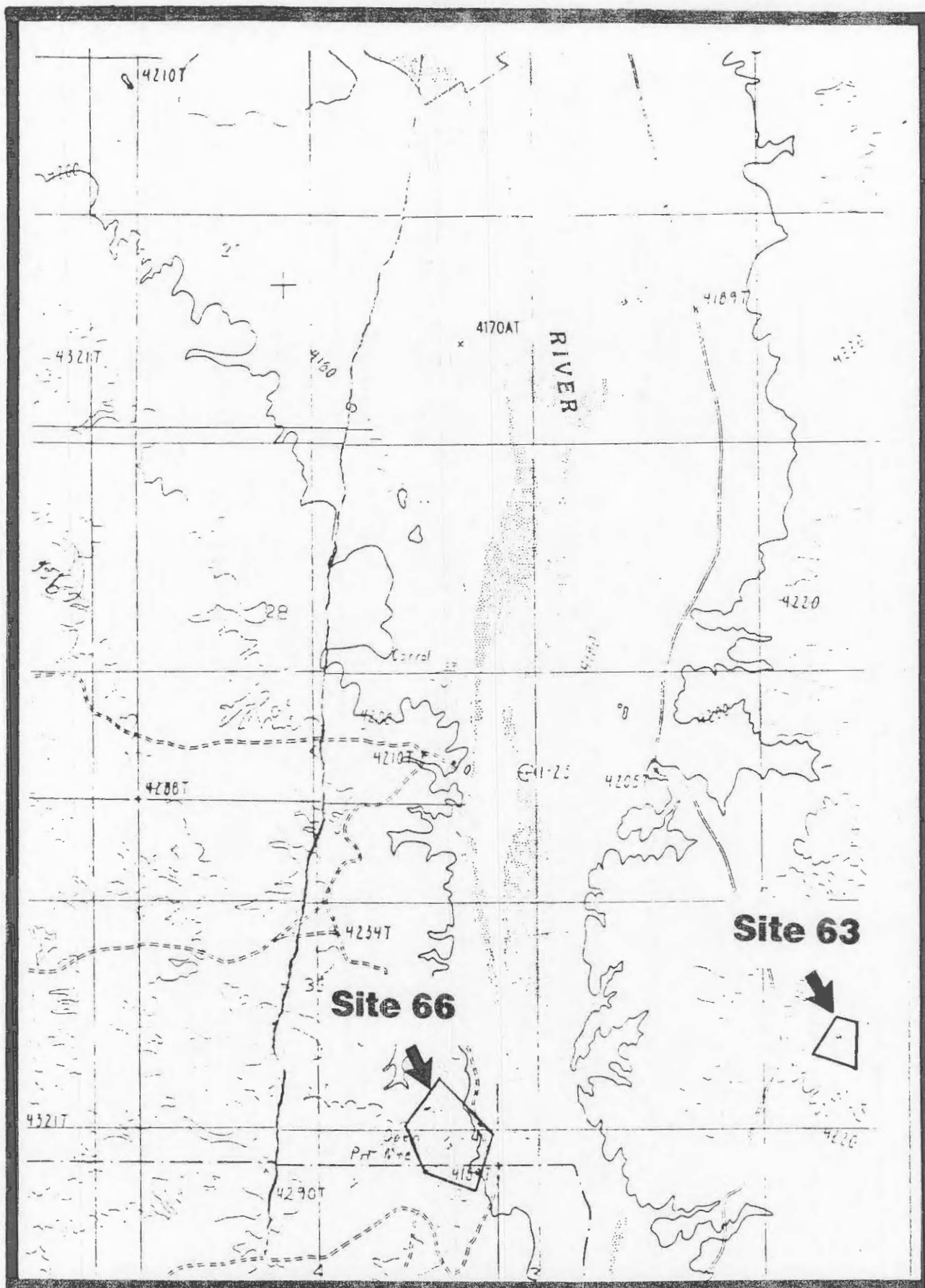


Figure 3b. Specific USGS Map Location of AZ-N-11-07 (NAMLRD # 63, 66)  
USGS 7.5' Name: Cameron SE, Arizona 1988 Prov. Edition.



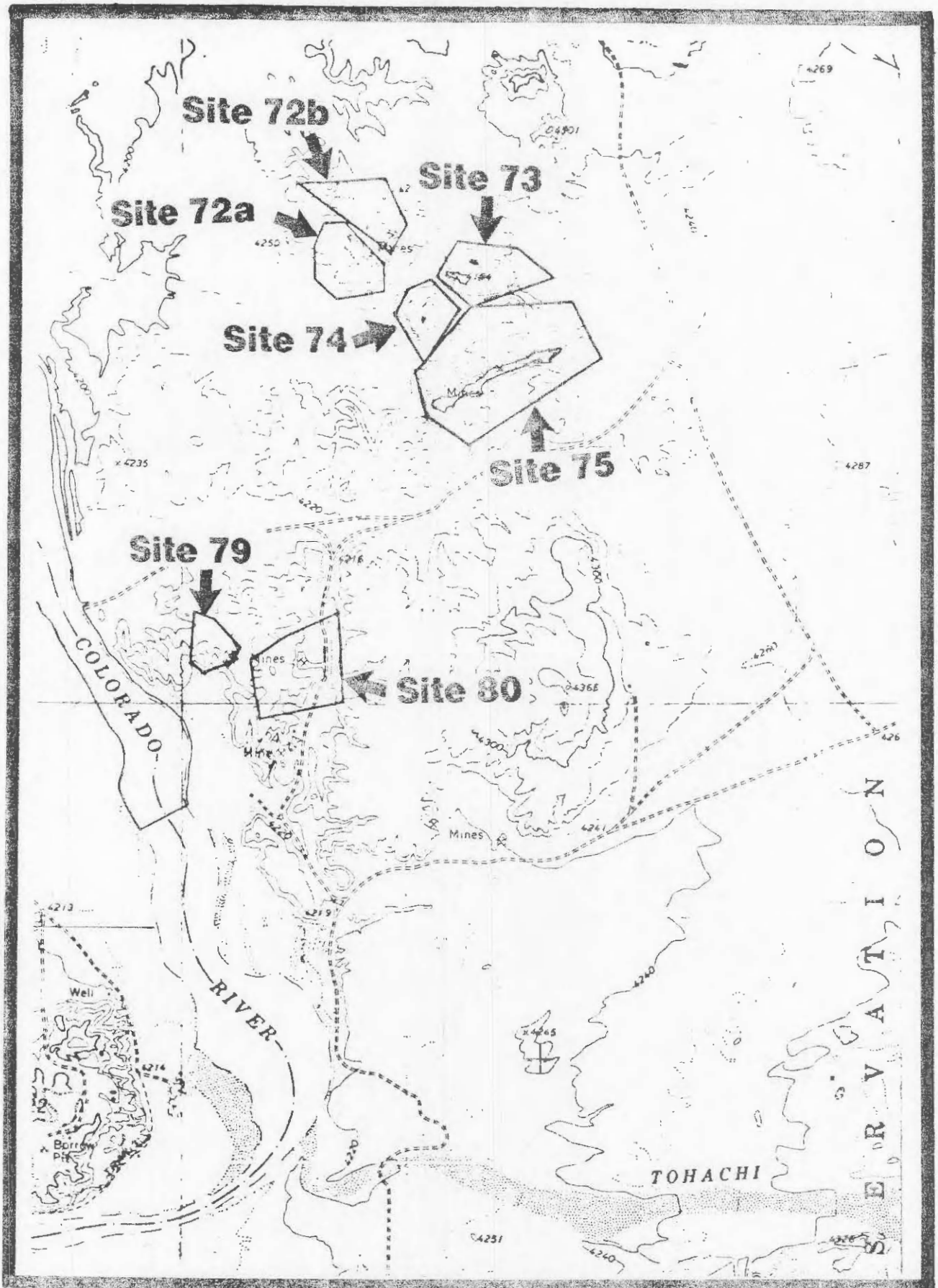


Figure 3c. Specific USGS Map Location of AZ-N-22-01, AZ-N-22-02, AZ-N-22-03, AZ-N-22-04, AZ-N-22-05, AZ-N-22-06 (NAMLRD # 72 a,b, 73, 74, 75, 79, 80) USGS 7.5' Name: Wuptaki NE, Arizona 1969.

Table 1. Size, NNAD Site Numbers, and UTM Coordinates (Zone 12) for the nine NAMLRD Projects, NNAD 92-146. ( CP designations match letter designations in Figures 4-14)

NAMLRD Area	Site Number	Acres	UTM Coordinates
55	AZ-N-11-06		Center 3959400N, 468250E
(a)		25.9 ac	CP A 3959220N, 468030E CP B 3959380N, 467940E CP C 3959600N, 498430E CP D 3959520N, 498580E
(b)		12.3 ac	CP A 3959480N, 468950E CP B 3959660N, 468560E CP C 3959750N, 468590E CP D 3959640N, 468960E
63	AZ-N-11-07	7.5 ac	Center 3957350N, 472300E CP A 3956910N, 470780E CP B 3957330N, 472220E CP C 3957490N, 472320E CP D 3957470N, 472410E
66	AZ-N-11-08	25.3 ac	Center 3956900N, 470550E CP A 3956910N, 470780E CP B 3956850N, 470740E CP C 3956860N, 470460E CP D 3957030N, 470390E CP E 3957230N, 470550E
72	AZ-N-22-01		Center 3955050N, 472450E
(a)		15.2 ac	CP A 3954800N, 472910E CP B 3954750N, 472700E CP C 3954940N, 472600E CP D 3954980N, 472600E CP E 3955100N, 472640E CP F 3955100N, 472720E CP G 3954900N, 472920E
(b)		18.7 ac	CP A 3954950N, 472940E CP B 3955260N, 472940E CP C 3955280N, 472920E CP D 3955080N, 473020E
73	AZ-N-22-02	20.2 ac	Center 3954850N, 473200E CP A 3954830N, 473680E CP B 3954720N, 473300E CP C 3954860N, 473150E CP D 3955020N, 473250E CP E 3954980N, 473510E

74	AZ-N-22-03	15.1 ac	Center 3954650N, 473100E CP A 3954480N, 473090E CP B 3954700N, 472960E CP C 3954800N, 473020E CP D 3954840N, 473130E CP E 3954720N, 473240E
75	AZ-N-22-04	105.8 ac	Center 3954500N, 743400E CP A 3954140N, 473290E CP B 3954250N, 473100E CP C 3954440N, 473050E CP D 3954730N, 473300E CP E 3954740N, 473760E CP F 3954510N, 473890E
79	AZ-N-22-05	7.8 ac	Center 3953300N, 472250E CP A 3953190N, 472240E CP B 3953180N, 472200E CP C 3953140N, 472100E CP D 3953180N, 472040E CP E 3953400N, 472060E CP F 3953380N, 472140E CP G 3953250N, 472260E
80	AZ-N-22-06	32.5 ac	Center 3959200N, 472600E CP A 3953000N, 472730E CP B 3952930N, 472350E CP C 3953200N, 472310E CP D 3953300N, 472480E CP E 3953390N, 472700E

residual or fluvial and vary in terms of parent material; from clay to cobbles to Tolchaco gravels, most often poorly sorted.

The project areas range in elevation from 4,041 feet (1,231 m) north of the Little Colorado River to of 4,338 feet (1,322 m) for an area south of the Little Colorado River. The plant community is Great Basin Desertscrub and includes prickly pear, rabbitbrush, snakeweed, narrow leaf yucca, Russian thistle, Mormon Tea, groundsel, camel thorn, sparse grasses, and tamarisk. Animal life is limited in number and kind, and these days the most visible animals are domestic livestock. With the exception of the Little Colorado River, surface water is in short supply.

### PREVIOUS RESEARCH AND CULTURE HISTORY

No extensive archaeological research has been conducted in the immediate vicinity of the reclamation project areas. Small scale surveys have been conducted around Cameron in advance of developments-- roads, water lines, power lines, gravel pits and the like-- but these have shed little light on the culture history of the area. For an overview of this area, perhaps the most significant work conducted in the general region around Cameron includes the Wupatki Survey (Anderson 1990), excavations along the Four Corners Pipeline (Brugge, Bliss, and Crabtree n.d.), and the excavation of Arizona 1:3:1 along the Black Mesa Pipeline (Ward 1976).

A check of site and project files at NNHPD and NNAD revealed that four projects have been previously undertaken and three sites were recorded within one kilometer of the project area. See Table 2. for a description of each site.

### FIELD METHODS

In early May, 1992, Brady TwoBears and Davina Begaye, Staff Archaeologists of NNAD-NAU, were taken to each of the nine project areas by NAMLRD Reclamation Specialist Tony Robbins. Robbins explained the nature of the proposed undertaking in detail. Field work was conducted May 1, 4, 5, 13, and June 3, by Brady TwoBears, Davina Begaye, and Alfred Livingston.

The Cameron Chapter was informed about "Cameron Project 1, Cameron Project 2, Cameron Project 3" by delivering maps and a letter to Ace Charles, President Cameron Chapter, and Howard Dugi, Cameron Chapter Manager, outlining the size and scope of the project. Both men were also consulted as to the existence of Traditional Cultural Properties within the proposed project areas. They suggested that the local residents of Cameron be interviewed; a process which was completed by Grace Morgan of NNAD-NAU. A description of the proposed reclamation, along with associated maps, was also posted at the Cameron Chapter for the convenience of the community.

Grace Morgan, of NNAD-NAU, traveled throughout the Cameron Chapter inquiring about the existence of Traditional Cultural Properties or TCPs, such as grave sites, and sacred, ceremonial or

Table 2. Projects Undertaken and Sites Recorded within a 1 km Radius of the Eleven Project Areas for NNAD 92-146.

Project Number	Site Number	Description
NNAD 91-017	AZ-N-11-1	Historic Uranium open pit mine
MNA 81-335 (NAU 86-190)	NA 7389	Kayenta Anasazi site (A.D. 1070-1180)
MNA 78-273 (A-78-147)	NA 1656	Pueblo III small habitation cluster (ca. A.D. 1200)
NNAD 91-375	AZ-N-5-4	Historic Uranium open pit mine
	AZ-N-5-5	Historic Uranium open pit mine
	AZ-N-5-6	Historic Uranium open pit mine
	AZ-N-5-7	Historic Uranium open pit mine
	AZ-N-11-3	Historic Uranium open pit mine
	AZ-N-6-1	Historic Uranium open pit mine
	AZ-N-11-4	Historic Uranium open pit mine
	AZ-N-11-5	Historic Uranium open pit mine
	AZ-N-12-8	Historic Uranium open pit mine
	AZ-N-11-9	Historic Uranium open pit mine
	AZ-N-11-10	Historic Uranium open pit mine

plant gathering areas. In addition, Morgan conducted ethnographic research regarding the effect, that the uranium mining has had on the Navajo people. During her interview, she explained that the uranium mines were in the process of being reclaimed after all these years, and that it was her duty to inquire about the existence of TCPs in or nearby the uranium mines.

Grace Morgan visited homes located near the uranium mines to conduct her interviews throughout the summer of 1991. The results of her interviews will apply to future NAMLRD reclamation projects, since Morgan visited most homes next to uranium mines. A total of fifty-one residences and a Nazarene Church were visited. Only eighteen actual interviews were conducted with all but three conducted in the Navajo language. Further information concerning Morgan's interviews is discussed later under the heading "SACRED PLACES".

The goal of reclaiming abandoned mines insures that cultural resources will be encountered, since every project area proposed for reclamation is perforce an archaeological site. The nine project areas qualify as archaeological sites because they contain evidence of historic mining. Since each reclamation project area is centered on some form of significant prospecting or mining feature/features, the fieldwork was essentially one of documentation rather than survey per se. The boundaries of each of the nine project areas was staked by NAMLRD, and consequently these staked boundaries were treated as the boundaries for the nine historical sites. Fieldwork consisted of mapping and recording all remains contained within these boundaries.

NAMLRD provided detailed topographic maps for each of the nine project areas. These maps were used to locate features and other finds and served as base maps for the preparation of site maps. During the mapping and recording process the entire surface of each project area was surveyed. The project areas included mine pits and trenched areas both associated with waste rock and/or protore piles. Notes were taken in the field and later incorporated into NNAD site forms.

An important source of information about mining activity in the area came from geologic and Arizona mine inspection reports, which were used to abstract a general history of uranium mining in the region and how specific mines were operated. This information is included in the site forms in Appendix A, and in the Cultural Resource Findings section.

### CULTURAL RESOURCE FINDINGS

All archaeological sites documented during this survey consist of the nine reclamation project areas. The only remains of cultural activity that were observed remains from mining and later use of the mine pits are primarily stock ponds for livestock, residential waste disposal sites, and swimming areas and/or "party" areas.

Reports written during and after the late 1950s and early 1960s (the Uranium Boom) were consulted for information regarding the history of the nine mine sites. However,



Little information has been published concerning working conditions in the mines on the Navajo Reservation. Limited surveys by the Public Health Service and other agencies have documented exposures to radon gas and silica dust (Samet 1984:1).

The actual physical damage that the Cameron uranium miners and the community have suffered from the mines that have been left open for at least 30 years is undetermined.

Uranium mining commenced in and around Cameron, Arizona with the 1949 discovery of uranium at Lee's Ferry in the Vermillion Cliff District (Tuck 1963:46), and in 1950 by Hosteen Nez, a Navajo who discovered uranium on Wards Terrace (Scarborough 1981:31). Later discoveries by "surface prospecting and surface and airborne radiometric surveys" soon followed. In 1952, Charlie Huskon, a Navajo from Cameron, Arizona, made the first discovery of commercial importance. Although the northeastern corner of Arizona produced prime uranium, "As of 1959 the best uranium deposits found in Arizona in Chinle Formation were in the Cameron District" (Payne 1986:1,2).

The Arrowhead Uranium Company was the lessee and was responsible for mining operations at this time. Later, Cameron uranium was mined by a number of private parties and companies. Uranium ore were first shipped to Monticello, Utah, then to the Blue Water Mill in New Mexico. By 1956 shipments were directed to the new uranium processing plant constructed by the Rare Metals Corporation of America in Tuba City, Arizona, on the Navajo Reservation. "In early operations, about 300 tons of ore per day were processed using an acid leach, sand-slime separation and resin-in-pulp ion exchange process." Overall, this mill "processed 800,000 tons of ore with average grade of 0.33%  $U_3O_8$  and produced 2,348 tons of  $U_3O_8$  in concentrate form" until 1966 (Scarborough 1981:280, 281).

In Coconino County, which includes Cameron, Arizona, uranium ore production from 1958-1959 totalled 83 tons and was valued at \$2,234 in 1958 and \$1,756 in 1959 (Knight 1961:22). Sixty-seven mines in the Cameron area produced 1,117,500 lbs. of  $U_3O_8$  from the Petrified Forest Member, while a remaining twenty-seven mines in the "underlying sandstone and siltstone member account for 62,500 lbs. of  $U_3O_8$ ." From 1954-1963 a total of 292,415 tons of an of 0.21%  $U_3O_8$  was mined from the lower part of the Chinle Formation (Triassic Age), thus establishing "the Cameron region [as] the 4th largest uranium production district in Arizona" (Scarborough 1981:31, 32).

The Atomic Energy Commission of the Federal Government was the sole purchaser of uranium, and consequently operated a buying station in Cameron, Arizona until 1962, when the demand for uranium slowed. In 1962 mining ceased at Cameron, and at least 45 open-pit mines and their adjacent tailings piles were left open on Navajo public for the next thirty years (Schwennesen 1989:2-1).

Chas. M. McConnell, of the USGS Branch of Mines, and R.C. Derzay, a Mining Health and

Safety Engineer, reported regularly on the activities and progress of most, if not all, of the uranium mines in Cameron.

McConnell commented on the progress of mines, thus, covering the quantity of ore mined, procedure, equipment, and number of men involved with uranium mining in the '50s and '60s. "Mining was done by open pit methods, except for a few shafts and adits from the bottom of several pits" (Payne 1986:2). The following passage describes the actual procedure of mining involved with the nine project areas:

Open pit stripping method...was accomplished by drilling and blasting of thicker ore bodies and hand loading of thinner and isolated ore bodies. Drilling was by both portable auger type drills and by jack hammers. Thin areas of ore were broken out by use of pneumatic concrete breakers. Ore was stockpiled close to the mines by mobile loaders and wheelbarrows...[Mostly Navajo] operate the mobile loaders, drills, and do the hand mining. The men work 5 1/2 days a week on a singly shift basis and produce about 3,000 tons a month (McConnell April 9, 1958:1). A typical shift for a miner in the pit would include drilling, hand picking ore and shoveling, each task of about equal duration throughout the shift (Derzay Feb. 18-19, 1959:1).

In contrast, non-local Anglo men managed and supervised the mines, and they were the only people qualified to handle the explosives. Economic constraints limited the pits to a "stripping ratio of 13 feet of waste for 1 foot of ore. Exploratory drilling was correspondingly limited to about 140 feet in depth" (Payne 1986:2).

Usually, the crew of Navajo laborers numbered no more than 30 men. AEC-BIA negotiations in 1949-50 at Window Rock allowed for the hiring of local Navajo uranium prospectors...Charlie Huskon, a Cameron resident became such a prospector and located a number of Chinle formation occurrences in 1951. Mining permits given to him by the Navajo Tribe were used for mining the Huskon ore bodies by the Arrowhead Mining Company of Grand Junction, Colorado. The Navajo prospector program was more successful at Cameron than at any other region on the reservation (Scarborough 1981:280).

Actual written and published ethnographic studies concerning Navajo miners in the Cameron area are as of today nonexistent.

R.C. Derzay, a Mining health and Safety Engineer, was required by law to identify and correct all hazards at the Cameron Uranium mines in Arizona through written reports. His observations and recommendations hardly varied. Exposure to radiation was of a minor concern in most of his reports, since the radiation level was reportedly very low.

A gamma ray survey...using a nuclear Geiger counter calibrated with a cobalt 60 source, indicated gamma radiation levels to be low. Maximum intensities measured were 0.1 and 0.15 milliroentgens per hour as compared with 6.0 milliroentgens per hour permissible exposure rate based on a 13 week, 40 hours per week accumulative maximum dosage of 3125 milliroentgens



(Derzay Feb. 18 & 19, 1959:4).

Radioactive dust caused by the mining of uranium was also of minor concern, although the crew men were not to work during severe dust storms. In general, dust produced by uranium mining is contaminated by radon daughters, which decay from radioactive radon gas. If inhaled for long periods of time, it is highly possible that one could develop cancer, as was the case in the Shiprock, New Mexico underground uranium mines.

Excess mortality from lung cancer has been demonstrated in Navajo men who mined uranium in this region. A follow-up study of 780 American Indian miners, primarily Navajos, showed 11 deaths from respiratory cancer who were admitted to the Shiprock Hospital between 1965 and 1979, 16 had mined uranium (Samet 1984:1481).

Radon daughters in the open-pit mines of Cameron, Arizona were reportedly "so low as to be unmeasurable." In Derzay's report, he states the accepted belief of the hazard, or lack thereof, of contaminated uranium mine dust in Cameron, Arizona. "It was believed the shale and clay tended to cushion the sand grains thus minimizing the forming of fine dust." His reports also state that the roads were often sprinkled with water to further minimize the risk of inhaling contaminated dust (Derzay Feb. 18 & 19, 1959:4). Documentation is not available on the possible physical effects, if any, suffered by the Navajo miners in the Cameron, Arizona vicinity.

In almost every report, Derzay recommended that the crew men be encouraged to wear safety gear provided for them. However, based on his examinations the men chose not to do so. The recommended safety gear included: safety toe shoes, glasses or goggles, respirators (during windy days) and hard hats. Whether or not they were actually briefed on the hazards of uranium mining is not known.

Extensive historical documentation for these nine mines is minimal because of the relative isolation of these mines, and consequently modern trash is scant in the following site descriptions. The numbering of each item recorded and identified for each site (in the site descriptions) corresponds to the numbers shown on the associated site maps.

## Sites

**AZ-N-11-06 (Figures 4 & 5)**

AML Project Area: 55 a, b

Mining Claim: Charles Huskon No. 10 (Mining Permit No. 76)

Site Type: Uranium ore open pit mine

USGS Map Reference: Cameron SE, Arizona, 7.5' min, 1988 Provisional edition.

UTM Coordinates:

**a**

CP A 3959220N, 468030E

CP B 3959380N, 467940E

CP C 3959600N, 498430E

CP D 3959520N, 498580E

**b**

CP A 3959480N, 468950E

CP B 3959660N, 468560E

CP C 3959750N, 468590E

CP D 3959640N, 468960E

Site Size: **55 a**

CP A-B 675 ft. (205 m)

CP B-C 1765 ft. (538 m)

CP C-D 604 ft. (184 m)

CP D-A 2085 ft. (635 m)

**55 b**

CP A-B 1908 ft. (581 m)

CP B-C 352 ft. (107 m)

CP C-D 1249 ft. (380 m)

CP D-A 484 ft. (147 m)

Site Description: The site consists of two open uranium mine pits, waste ore piles, and associated historic trash. Site 55a consists of a 48 ft. (14 m) deep trench (SW-NE) 1,185 ft. (360 m) long and 237 ft. (72 m) wide. The main ore waste piles lie on the SW and NE parts of the project area. Trash consisted solely of historic trash. Site 55b consists of an adit that measures 10 ft. (3 m) deep, 264 ft. (80 m) long, and 88 ft. (27 m) wide. The main body of waste ore surrounds this adit, and a secondary pile is situated 616 ft. (187 m) west of the adit. Trash is comprised of historic trash. Items inventoried at 55a include:

1. rusted tin can
2. Roma wine bottle
3. aluminum foil
4. cardboard
5. 3 ft. metal bar
6. 2 oil cans
7. 2 oil cans
- 2 ft. steel bar
8. barrel stove
9. food can/rusted piece of metal
10. wooden stake
11. rubber tube
12. crushed oil can

13. license plate
14. 2" screw/bottle
15. cable/5 gal. oil drum
16. steel pipe/oil can
17. 3 crushed oil cans
18. pull tab Dr. Pepper can
19. gas can
20. 2 oil cans  
3 pieces of metal
21. 2 pieces of rubber
22. 5 gal. gas can
23. piece of canvas
24. 3 crushed oil cans
25. 4 pieces of burnt metal

Items inventoried at 55b include:

1. wooden stake
2. Red Rock Cola bottle (ca. 1939)
3. food can
4. pop can
5. lithic scraper (see I.O Form)
6. 1" thick screw
7. pop can
8. orange juice can
9. food can
10. Kist bottle
11. tar paper
12. oil can
13. pull tab aluminum can
14. Natural Light beer can

Historic information was minimal except for descriptive progress reports concerning work on the mines. The mine was operated by the Rare Metals Corporation and produced 17.083 tons between 1953-61.

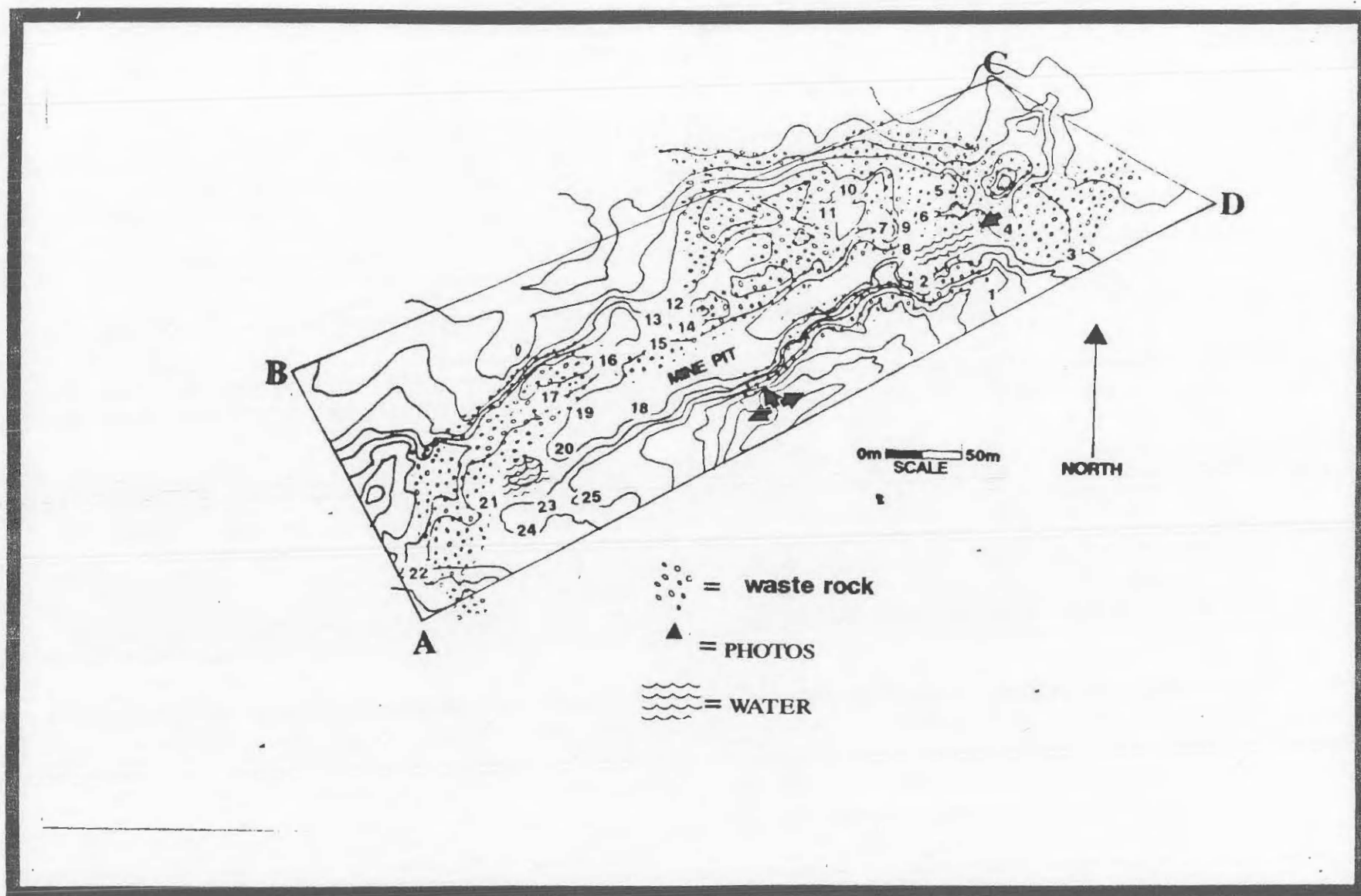


Figure 4. Specific Map Illustrating AZ-N-11-06 (NAMLRD # 55a).

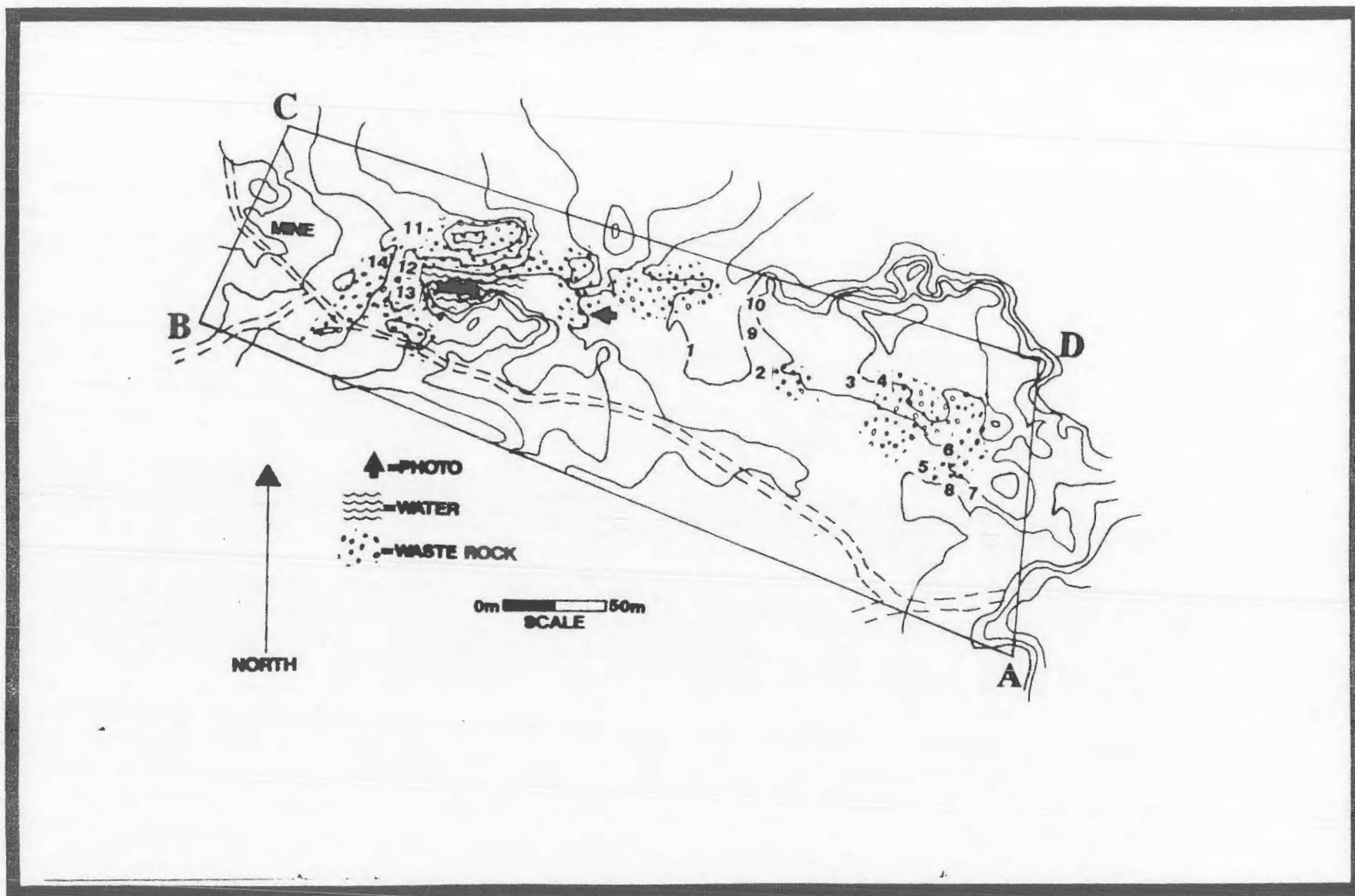


Figure 5. Specific Map Illustrating AZ-N-11-06 (NAMLRD # 55b).

**AZ-N-11-07 (Figure 6)****AML Project Area:** 63**Mining Claim:** Ryan No. 1 (Mining Permit No. 410)**Site Type:** Uranium ore open pit mine**USGS Map Reference:** Cameron SE, Arizona, 7.5' min., 1988 Provisional edition.

**UTM Coordinates:**

CP A	3956910N, 470780E
CP B	3957330N, 472220E
CP C	3957490N, 472320E
CP D	3957470N, 472410E

**Site Size:**

CP A-B	708 ft. (216 m)
CP B-C	627 ft. (191 m)
CP C-D	364 ft. (111 m)
CP D-A	668 ft. (203 m)

**Site Description:** The site consists of one main open ore pit mine 18 ft. (5m) deep. The pit is oriented NE- SW and is 486 ft. (148 m) long and 202 ft. (61 m) in width. The majority of the waste ore and rock surrounds the open pit on all the sides except for the southwestern portion. Items inventoried during the survey include the following:

1. Glass bottle (unidentified)
2. Coors bottle
3. Budweiser Light can
4. various small cow bones
5. various small cow bones
6. 20 ft. water pipe
7. rusted oil can
8. 40 ft. & 20 ft. water pipe
9. crushed Coca-Cola can
10. diet Pepsi can
11. 17 oz. spray can
12. Genuine Draft beer can
14. scrap metal

Historical information for this mine is infrequent, but a description of the existing mine was included:

The strip pit opened is about 100 feet wide and 300 feet long.  
 Overburden averages 25 ft. thick and the ore 3 ft. to 4 ft. thick.  
 At the time of examination the Ryan No. 1 claim was being drilled  
 by the permittee on close centers. No ore body has been found  
 as yet (McConnell April 9, 1958).

The mine was operated by the Ryan Oil Corporation and produced 17, 083 tons between 1953-61.

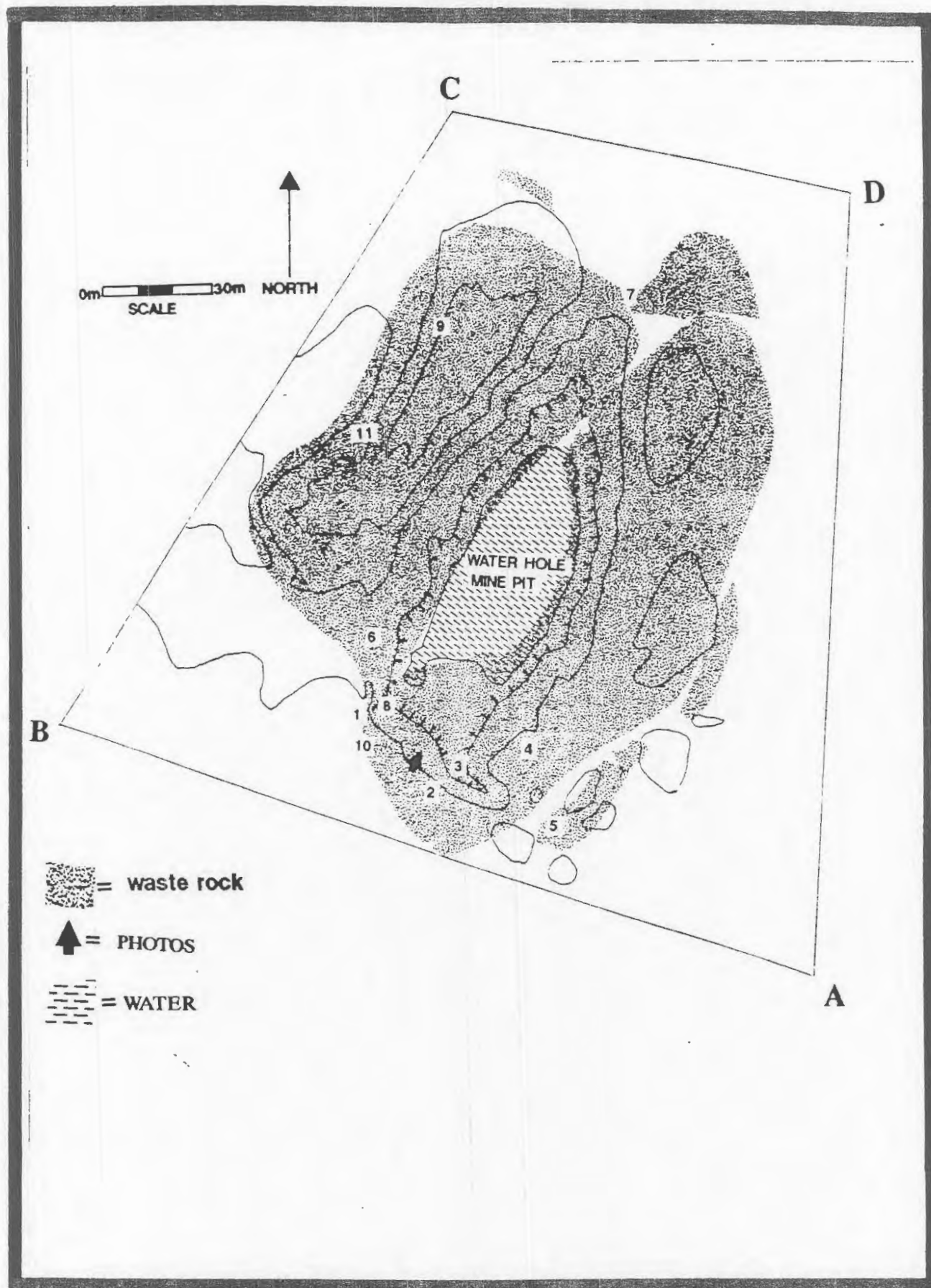


Figure 6. Specific Map Illustrating AZ-N-11-07 (NAMLRD # 63).



**AZ-N-11-08 (Figure 7)**

**AML Project Area:** 66

**Mining Claim:** Charles Huskon No. 11 (Mining Permit No. 76)

**Site Type:** Uranium ore open pit mine

**USGS Map Reference:** Cameron SE, Arizona, 7.5' min., 1988 Provisional edition.

**UTM Coordinates:**

CP A	3956910N, 470780E
CP B	3956850N, 470740E
CP C	3956860N, 470460E
CP D	3957030N, 470390E
CP E	3957230N, 470550E

**Site Size:**

CP A-B	870 ft. (265 m)
CP B-C	783 ft. (238 m)
CP C-D	739 ft. (225 m)
CP D-E	870 ft. (265 m)
CP E-A	1087 ft. (331 m)

**Site Description:** The site consists of a main pit (NE-SW) that is 24 ft. (7 m) deep and 522 ft. (159 m) in length and 87 ft. (26 m) wide. Waste ore piles lie on the SE edge of the main pit, 87 ft. (26 m) west of the main pit, and two concentrations north and east of the main pit. The southern boundary of the site is the fence line that separates the Navajo Reservation and the Cobon Ranch. Historic trash such as rusted oil cans, rusted aluminum cans, broken glass, a car seat, wire, and various modern trash (dated through cans and glass) were recorded. The presence of ash/charcoal stains throughout the project was noted by project archaeologists, but the origin is unknown. A list of items inventoried is as follows:

1. rusted can lid
2. rusted machine metal
3. rubber strap
4. AZ License plate (6684-P)
5. rusted tin can
6. rusted oil can
7. rusted oil can
8. 2 oil cans  
broken glass (Folgers)
9. rusted cable
10. burned trash basket  
pull tab aluminum can  
church key aluminum can
11. 1 1/2 ft. wire
12. car seat
13. rusted aluminum can, wire
14. 5 gallon gas can
15. 3 rusted, smashed oil cans
16. 7-Up bottle
17. 5 gallon rusted can
18. Coors can

Historical information for this mine states that no mining was conducted at this mine since July 1, 1959. This mine was also the largest source in the Cameron area from this particular member (McConnell march 16, 1960 & Scarborough March, 1981). The mine was operated by the Rare Metals Corporation and produced 2,747 tons between 1958-69.



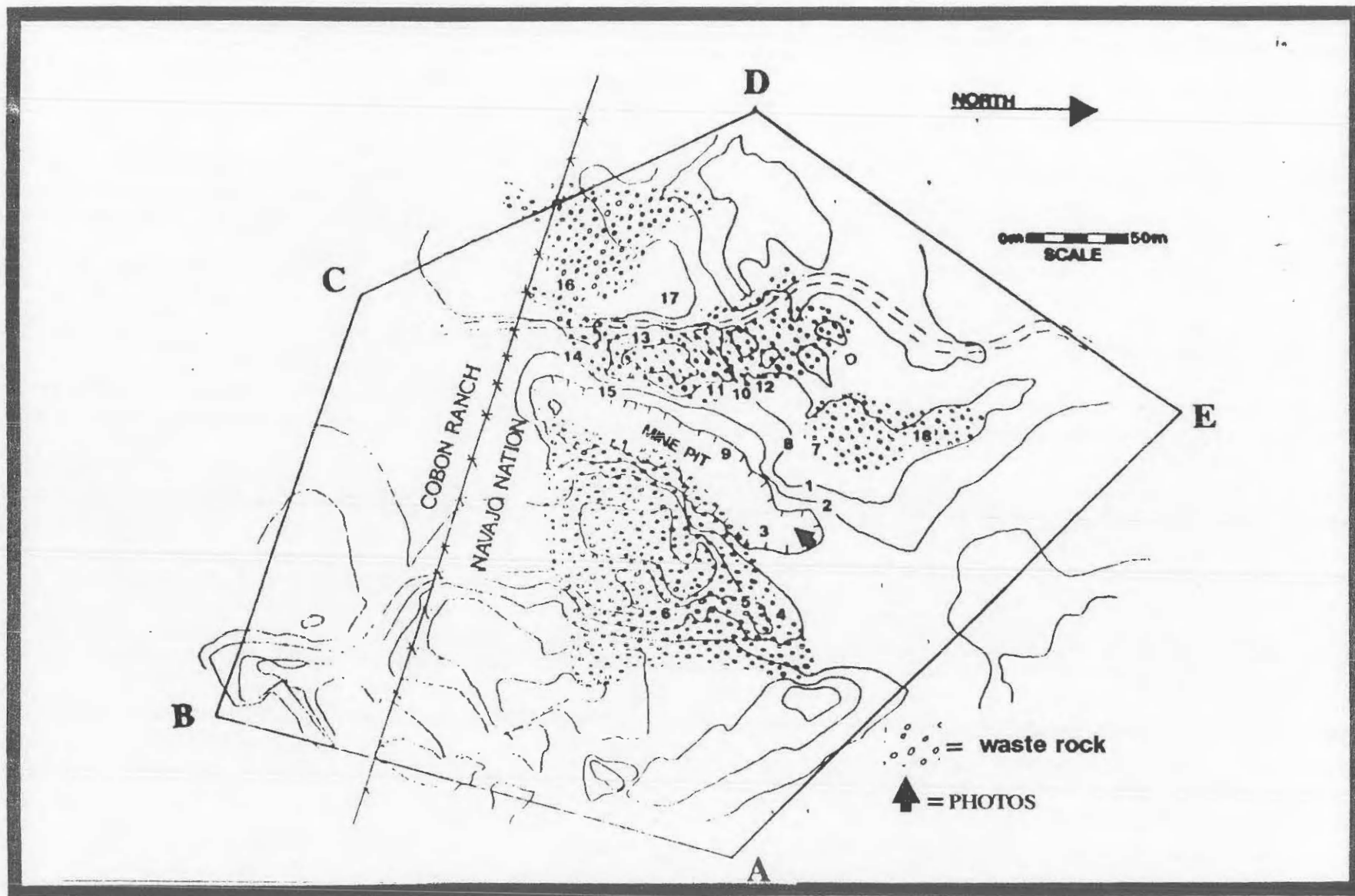


Figure 7. Specific Map Illustrating AZ-N-11-08 (NAMLRD # 66).

**AZ-N-22-01 (Figures 8 & 9)****AML Project Area: 72 a, b****Mining Claim: RAMCO No. 21 (Mining Permit No. 578)****Site Type:** Uranium ore open pit mine**USGS Map Reference:** Wupatki NE, Arizona, 7.5' min., 1969.**UTM Coordinates:****a**

CP A 3954800N, 472910E  
 CP B 3954750N, 472700E  
 CP C 3954940N, 472600E  
 CP D 3954980N, 472600E  
 CP E 3955100N, 472640E  
 CP F 3955100N, 472720E  
 CP G 3954900N, 472920E

**b**

CP A 3954950N, 472940E  
 CP B 3955260N, 472940E  
 CP C 3955280N, 472920E  
 CP D 3955080N, 473020E

**Site Size:****72 a**

CP A-B 707 ft. (215 m)  
 CP B-C 461 ft. (140 m)  
 CP C-D 430 ft. (131 m)  
 CP D-E 369 ft. (112 m)  
 CP E-F 338 ft. (103 m)  
 CP F-G 861 ft. (262 m)  
 CP G-A 492 ft. (149 m)

**72 b**

CP A-B 1706 ft. (520 m)  
 CP B-C 1312 ft. (400 m)  
 CP C-D 700 ft. (213 m)  
 CP D-A 481 ft. (146 m)

**Site Description:** The site consists of 2 open uranium mine pits, waste ore piles, modern trash, and associated historic trash. Site 72a consists of a trench (NW-SE) that is 40 ft. (12 m) deep and 246 ft. (74 m) in length. An adit is situated SE of the main trench and is 24 ft. (7 m) deep. Protore and waste rock piles lie between the trench and the adit and south of the adit. Site 72b consist of a small pit that measures 40 ft. (12 m) deep, (NW-SE) 350 ft. (106 m) in length, and (NE-SW) 481 ft. (146 m) in width. Trash includes: Budweiser beer cans, wooden stakes, various soda cans (root beer, Pepsi, and Coke), a dead cow, metal fragments, +/- 50 ft. rusted cable, and a rusted 5 gal. can. Items inventoried at 72a include:

1. 1 ft. rusted cable wire
2. wooden stake
3. wooden stake
4. Budweiser pull tab can
5. Barq's Root Beer can
6. wooden stake
7. Miller Lite can
8. Pepsi can

9. Budweiser can
10. Budweiser can
11. Budweiser can
12. Pepsi pull tab can
13. Budweiser can
14. cow skull
15. 5 gal. rusted gas can
16. 2 (possible) cow bones
17. rusted Ford can
18. wooden stake
19. 3 ft. long rusted connector bar
20. wooden stake
21. wooden stake
22. wooden stake
23. wooden stake
24. dead cow
25. Styrofoam ice chest lid
26. wooden stake
27. rusted cylinder

Items inventoried at 72b include:

1. 2 rusted metal oil cans
2. 1 ft. long stake
3. crushed commodity food can
4. 1 crushed metal oil can
5. rusted food can
6. crushed metal oil can
7. oil filter
8. oil filter
9. Cragmont Cola can
10. Bud Dry can
11. rusted piece of pipe
12. cow bone
13. rusted oil can
14. wooden stake
15. wooden stake
16. wooden stake
17. wooden stake
18. wooden stake
19. oil can
20. plywood pieces
21. oil can

Historic information on this mine was limited to mine inspection reports. McConnell reported that no production took place since June 1958 and that the dimensions of the claim was "rectangular in shape and contains 126.0 acres. A pit 300 ft. long and 200 ft. wide, averages about 20 feet deep, and the ore is found in three small areas in the bottom of the pit and is 3 to 4 feet thick" (McConnell 1957 May 28). The mine was operated by the Rare Metals Corporation and produced 3,171 tons between 1956-59.

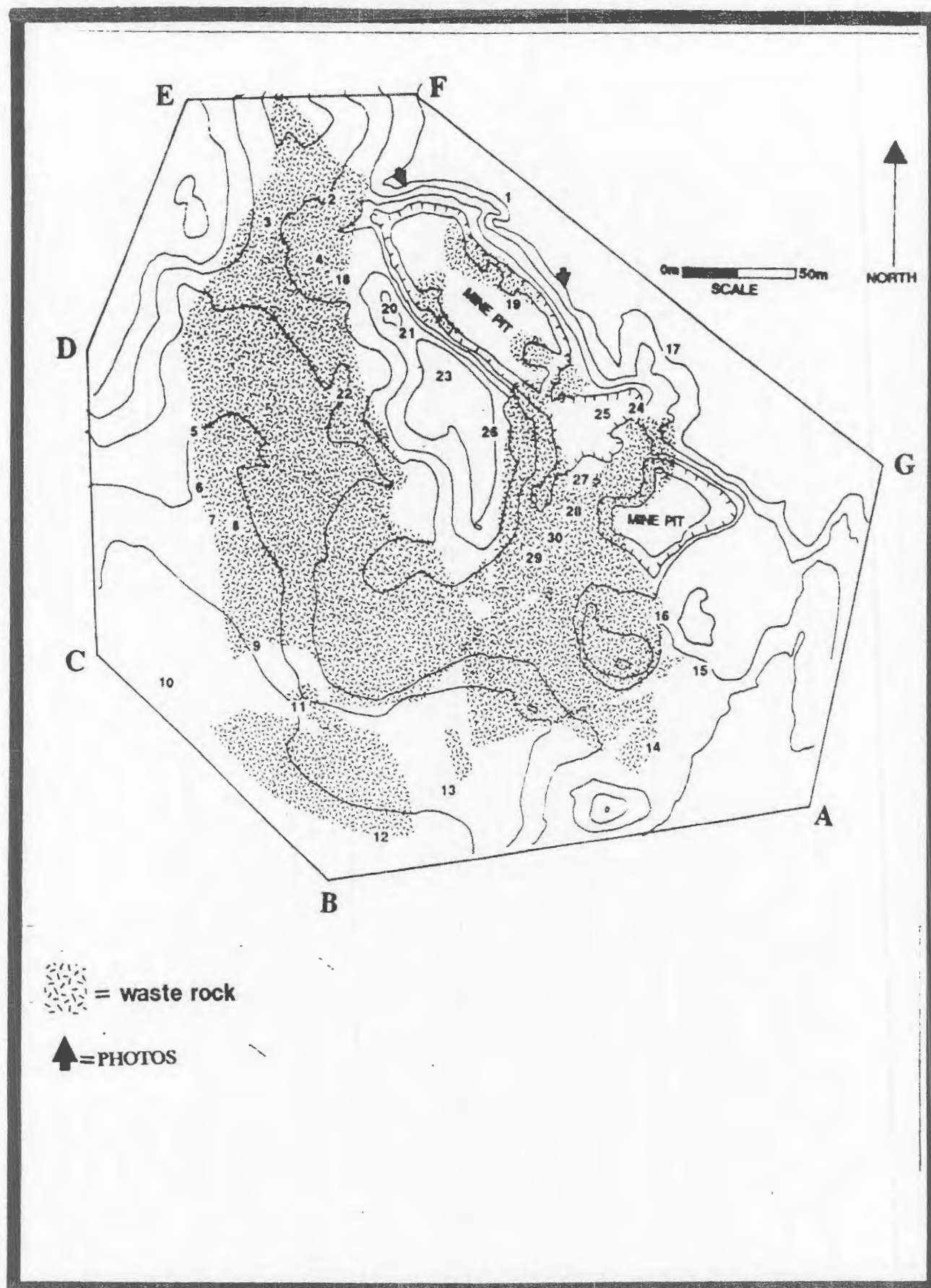


Figure 8. Specific Map Illustrating AZ-N-22-01 (NAMLRD # 72a).

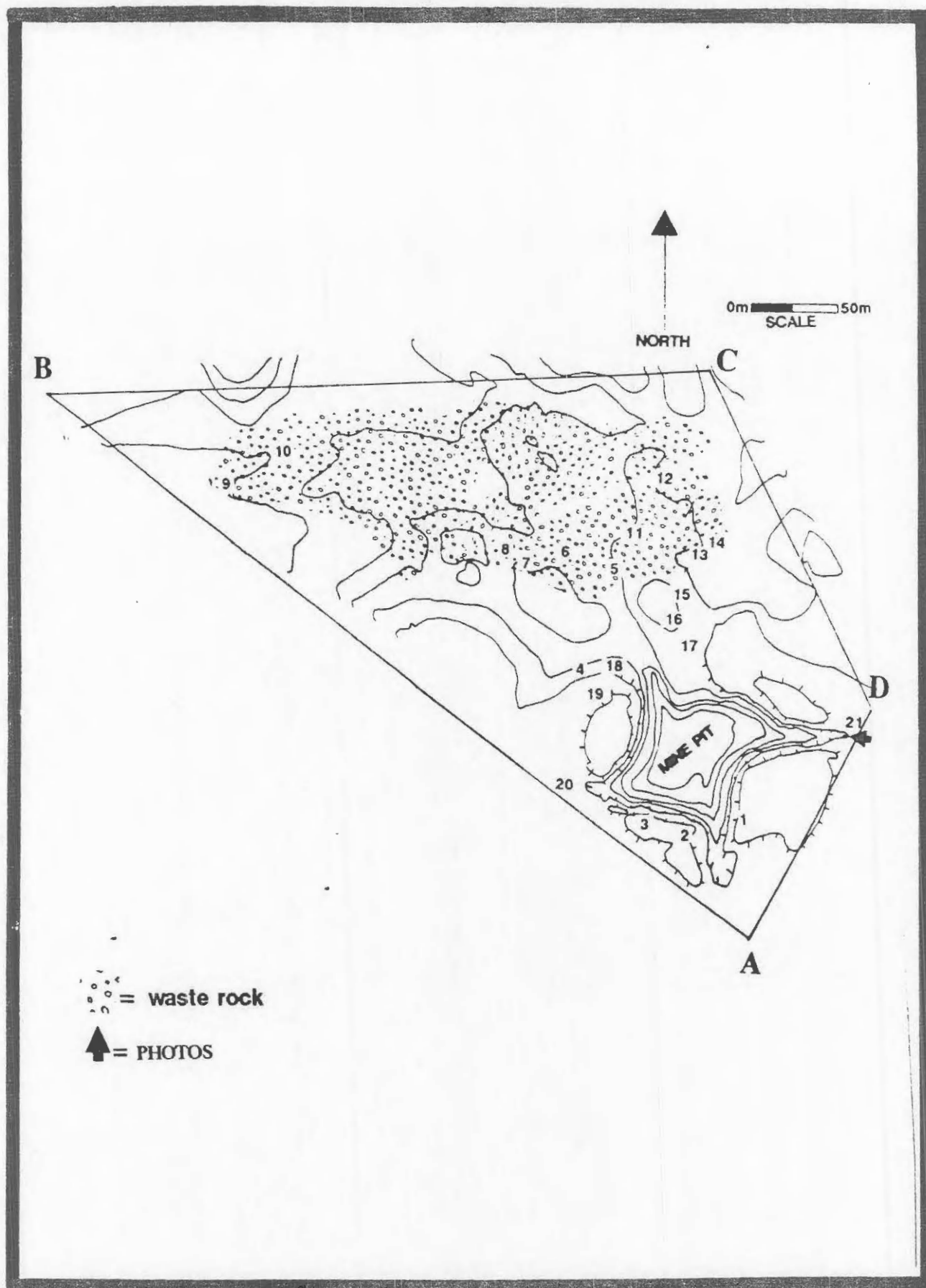


Figure 9. Specific Map Illustrating AZ-N-22-01 (NAML RD # 72b).

**AZ-N-22-02 (Figure 10)****AML Project Area:** 73**Mining Claim:** RAMCO No. 22 (Mining Permit No. 329)**Site Type:** Uranium ore open pit mine**USGS Map Reference:** Wupatki NE, Arizona 7.5' min., 1969.

**UTM Coordinates:**

CP A	3954830N, 473680E
CP B	3954720N, 473300E
CP C	3954860N, 473150E
CP D	3955020N, 473250E
CP E	3954980N, 473510E

**Site Size:**

CP A-B	1302 ft. (396 m)
CP B-C	604 ft. (184 m)
CP C-D	558 ft. (170 m)
CP D-E	883 ft. (269 m)
CP E-A	651 ft. (198 m)

**Site Description:** The site consists of 30 ft. deep trench/pit that is 558 ft. (170 m) in length and 186 ft. (56 m) wide. The waste ore/rock is located mainly on the eastern portion of the main pit. Items inventoried at the project area include:

1. old cardboard pieces in landfill
2. rusted decayed oil can
3. radiator piece  
barrel cover  
50 +/- chopped pieces of wire (75 ft.)  
cow bones (2 +)  
rusted smashed oil can  
milled lumber
4. cow rib bones (2 +)
5. 2 stake pieces
6. wooden stake

Historical information indicate that production from this mine stopped February, 1958. Only 20 tons of 0.29 percent ore were produced from this pit (McConnell May 10, 1961 & McConnell March 6, 1960). This mine was operated by the Rare Metals Corporation and produced 16,609 tons between 1956-59.

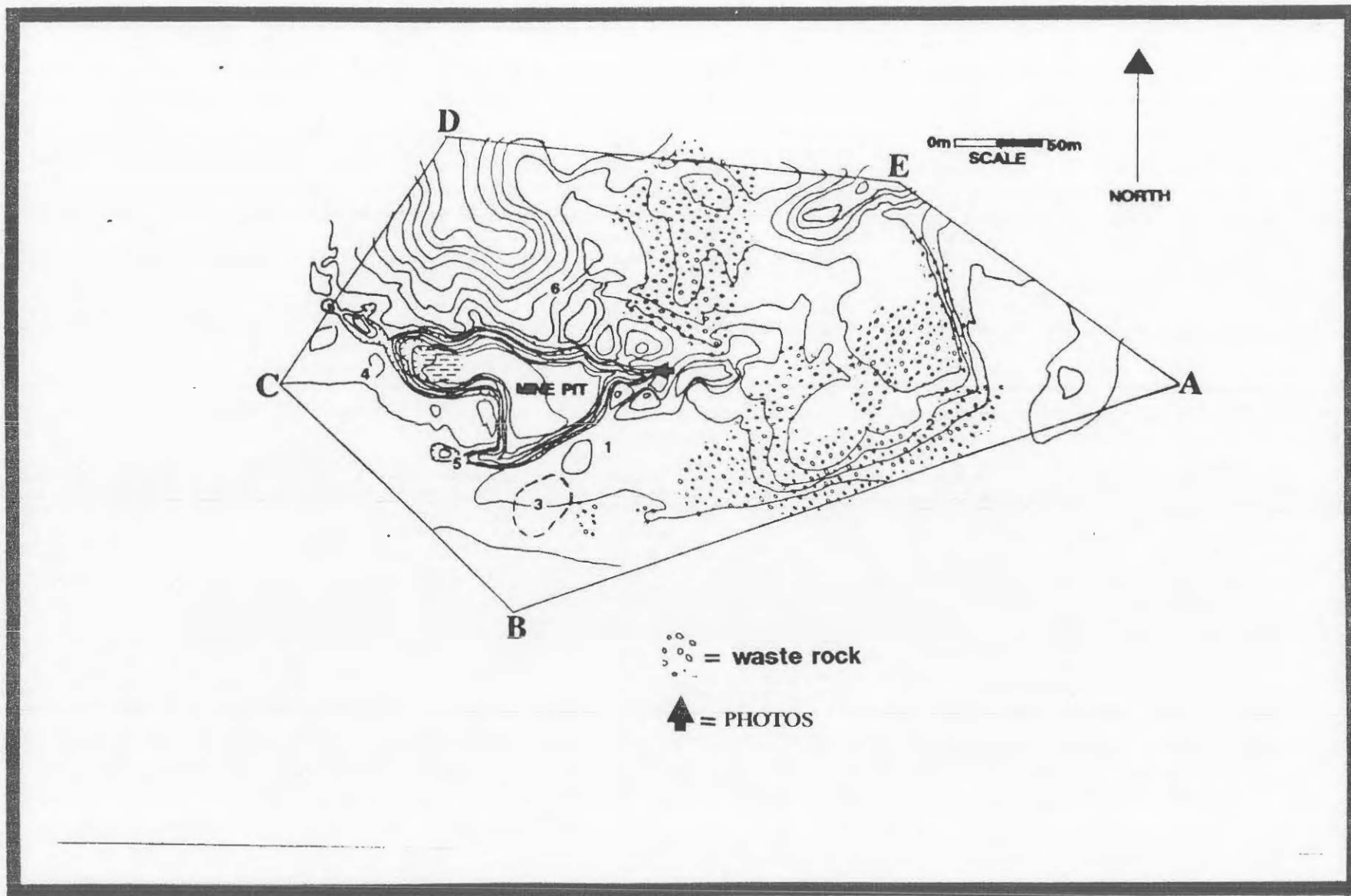


Figure 10. Specific Map Illustrating AZ-N-22-02 (NAMLRD # 73).



**AZ-N-22-03 (Figure 11)****AML Project Area: 74****Mining Claim: RAMCO No. 20 (Mining Permit No. 330)****Site Type:** Uranium ore open pit mine**USGS Map Reference:** Wupatki NE, Arizona, 7.5' min., 1969.

**UTM Coordinates:**

CP A	3954480N, 473090E
CP B	3954700N, 472960E
CP C	3954800N, 473020E
CP D	3954840N, 473130E
CP E	3954720N, 473240E

**Site Size:**

CP A-B	884 ft. (269 m)
CP B-C	408 ft. (124 m)
CP C-D	408 ft. (124 m)
CP D-E	612 ft. (186 m)
CP E-A	952 ft. (290 m)

**Site Description:** Site consists of two pits that are being used as watering holes by local cattle. The main ore waste piles lie on the southwest portion of the mine and interspersed throughout the southern and middle portions between the two main open mine pits. The eastern pit is 340 ft. (103 m) by 204 ft. (62 m) long. The western pit is 476 ft. (145 m) long and 204 ft. (62 m) wide. Both pits are oriented NW-SE. The two pits average a depth of 20 ft. (6 m). Items inventoried at this mine include:

1. 2 pieces of cable wire (7 ft. & 5 ft.)
2. 1 piece of cable wire (3 ft.)
3. cow bones
4. cow bones
5. 15 ft. cable
6. 50 ft. cable
7. 5 gal. rusted/smashed can
8. piece of rusted/smashed can
9. 30 ft. cable
10. cardboard box
11. cow bone
12. cow bone
13. 2 pieces of milled lumber
14. Milwaukee Beer cardboard case
15. wooden stake
16. Coors Light beer bottle
17. 2 cow bones
18. cow hoof
19. rusted piece of metal
20. Coors Light beer bottle
21. cow skull
22. 2 jaw bones w/ teeth
23. scatter of bones (8 +/-)
24. stake piece

Historical accounts for this mine indicate that there had been no production in this mine since June 1958, but that 20 tons of 0.26 percent  $U_3O_8$  ore had been produced from this mine. Other historical information has been minimal (McConnell March 16, 1960, October 14, 1958, & May 28, 1957). This mine was operated by the Rare Metals Corporation and produced 22,642 tons between 1956-60.



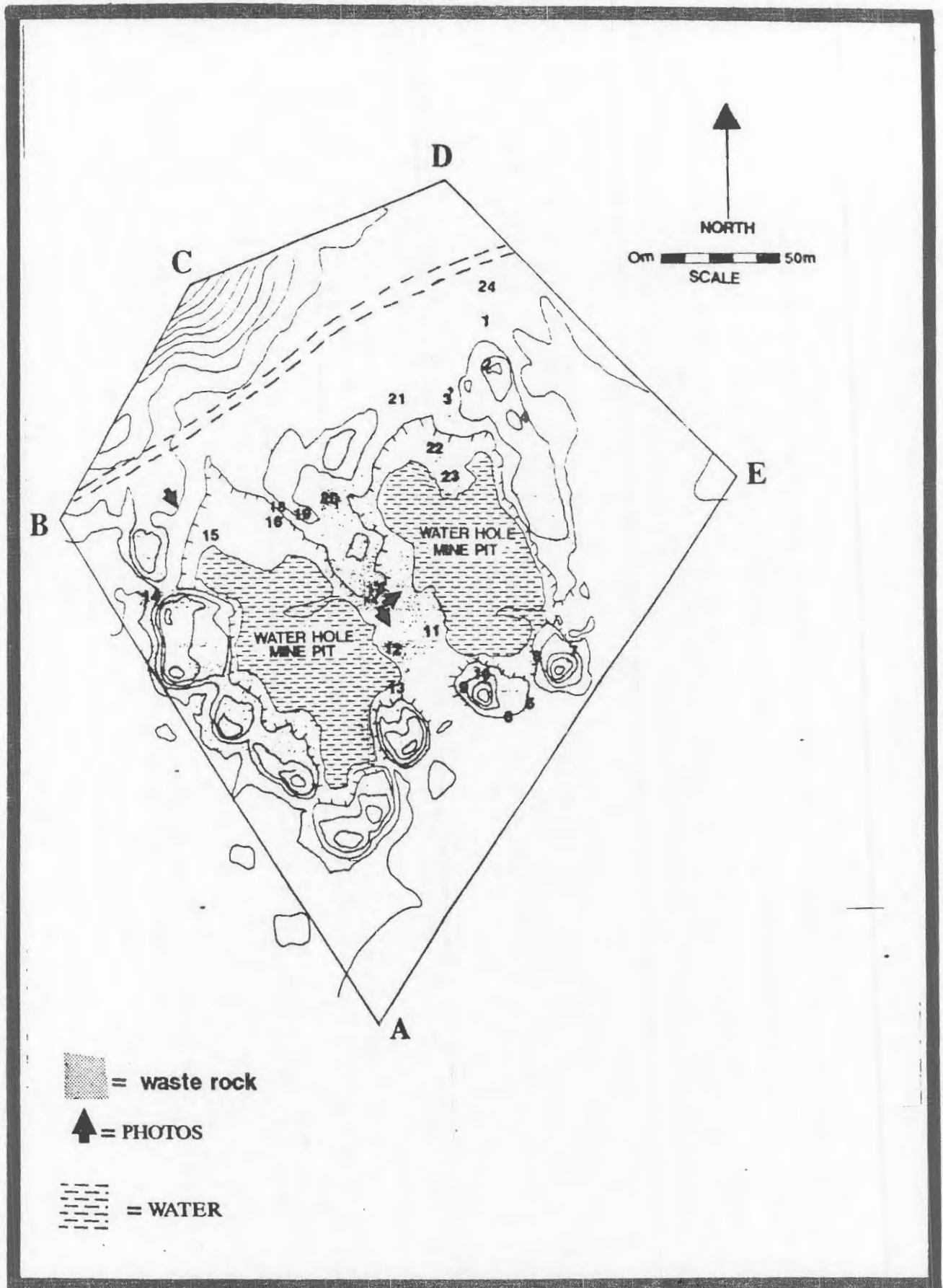


Figure 11. Specific Map Illustrating AZ-N-22-03 (NAMLRD # 74).

**AZ-N-22-04 (Figure 12)****AML Project Area: 75****Mining Claim: Ryan No. 2 (Mining Permit No. 410)****Site Type: Uranium ore open pit mine****USGS Map Reference: Wupatki NE, Arizona, 7.5' min., 1969.**

**UTM Coordinates:**

CP A	3954140N, 473290E
CP B	3954250N, 473100E
CP C	3954440N, 473050E
CP D	3954730N, 473300E
CP E	3954740N, 473760E
CP F	3954510N, 473890E

**Site Size:**

CP A-B	721 ft. (219 m)
CP B-C	721 ft. (219 m)
CP C-D	1648 ft. (502 m)
CP D-E	1442 ft. (439 m)
CP E-F	1133 ft. (345 m)
CP F-A	2678 ft. (816 m)

**Site Description:** Site consists of one large open ore pit mine measuring 73 ft. (22 m) deep, 2,472 ft. (753 m) long and 206 ft. (62 m) wide. Large waste ore/rock piles lie to the north and west of the open pit. This site is a rather large open ore pit mine that contained modern and historic trash. Items inventoried during survey include:

1. Bud Light aluminum can
2. cow skull
3. 5+ pieces of a broken bottle
4. old rusted can
5. cow hoof
6. 3 ft. heavy machinery piece
7. clear glass bottle
8. 7 ft. piece of black tubing
9. 3 ft. cable
10. 11 ft. cable
11. 1 ft. cable
12. 1 gal. smashed oil can
13. "Ormel" sausage can
14. orange plastic spray can
15. unopened aluminum can
16. 1" diameter embedded pipe
17. (3" diameter) 4 ft. long pipe
18. 1" diameter cable
19. 1" diameter cable
20. oil can
21. oil can
22. cardboard box
23. 3+ broken wooden stakes
24. oil can
25. rusted horse shoe
26. 1 ft. tangled cable
27. 60+ cable pieces
  - 12+ oil cans
  - 30 ft. cable

various tractor parts

6 m tractor tread

75 ft. +/- wire

5 gal. oil can

fan

hoses

29. oil can

30. storage room structure w/ milled lumber gate(?)

Hines root beer bottle

31. rusted 5 gal. gas can

32. oil can

33. 2+ plywood

34. stake

35. 1 gal. oil can

36. metal piece

37. crushed/rusted metal can

38. strip of (100% cotton) long sleeve shirt

39. metal rusted can

40. picket sign

41. rusted can

Historical information was minimal, but a description of the ongoing work and dimensions of the mine were discussed in the mine inspection reports (McConnell March 28, 1957). This mine was operated by the Ryan Oil Corporation and produced 2,066 tons between 1956-58.

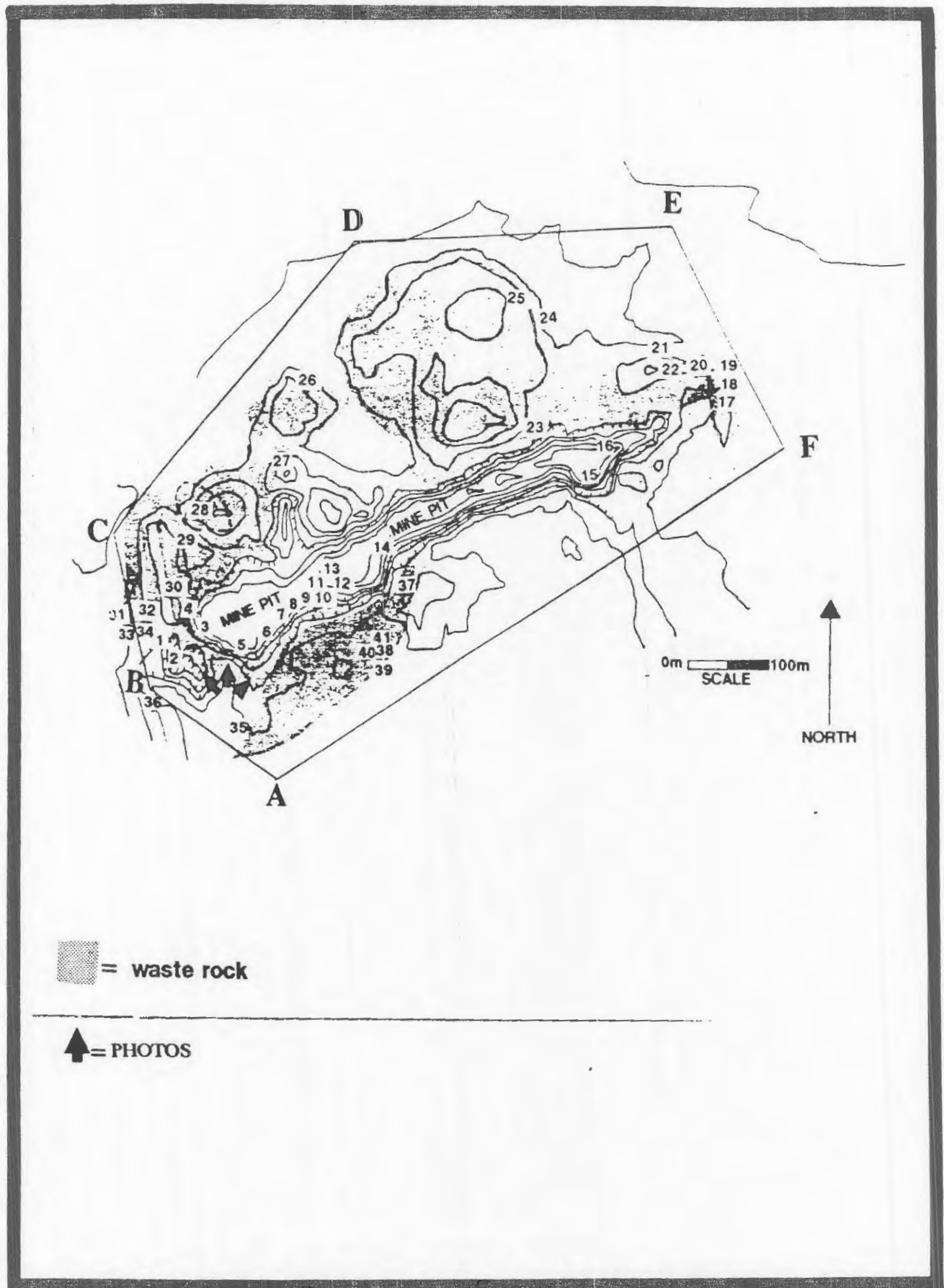


Figure 12. Specific Map Illustrating AZ-N-22-04 (NAML RD # 75).

**AZ-N-22-05 (Figure 13)****AML Project Area: 79****Mining Claim: Yazzie No. 1****Site Type:** Uranium ore open pit mine**USGS Map Reference:** Wupatki NE, Arizona, 7.5' min., 1969.

**UTM Coordinates:**

CP A	3953190N, 472240E
CP B	3953180N, 472200E
CP C	3953140N, 472100E
CP D	3953180N, 472040E
CP E	3953400N, 472060E
CP F	3953380N, 472140E
CP G	3953250N, 472260E

**Site Size:**

CP A-B	123 ft. (37 m)
CP B-C	445 ft. (135 m)
CP C-D	198 ft. (60 m)
CP D-E	816 ft. (248 m)
CP E-F	321 ft. (98 m)
CP F-G	594 ft. (181 m)
CP G-A	198 ft. (60 m)

**Site Description:** The site consists of one major pit and associated waste ore/rock piles throughout the site. The main pit measures 30 ft. (9 m) deep, 297 ft. (90 m) in width, and 247 ft. (75 m) in length. Waste ore/rock piles are concentrated on the eastern edge of the pit, but a large waste ore/rock pile is situated (NE-SW) immediately adjacent to the main pit. The items inventoried during survey include:

1. bottle of 7-Up (80s-90s)
2. 5 gal. rusted gas can
3. 5 gal. rusted barrel
4. 5 gal. rusted barrel
5. Budweiser can
6. 3-4 ft. long iron cable
7. 1 gal. antifreeze container
8. 2 ft. piece of milled lumber
9. 2 m diameter circle of broken glass
10. 2 ft. rusted metal flat piece

Historic information for this mine was obtained from mining inspection reports conducted through the 1950s and 1960s. The only report found mentions the following:

... is located about 18 miles south of the Cameron Bridge on the east side of the Little Colorado River. The mine is a strip pit about 200 ft. wide and 300 ft. long. Overburden averages about 30 ft. thick. The ore body varies from a thin section to 3 ft. thick (McConnell 1958 April 10).

This mine was operated by the Foley Brothers Inc. and produced 343 tons between 1956-57.

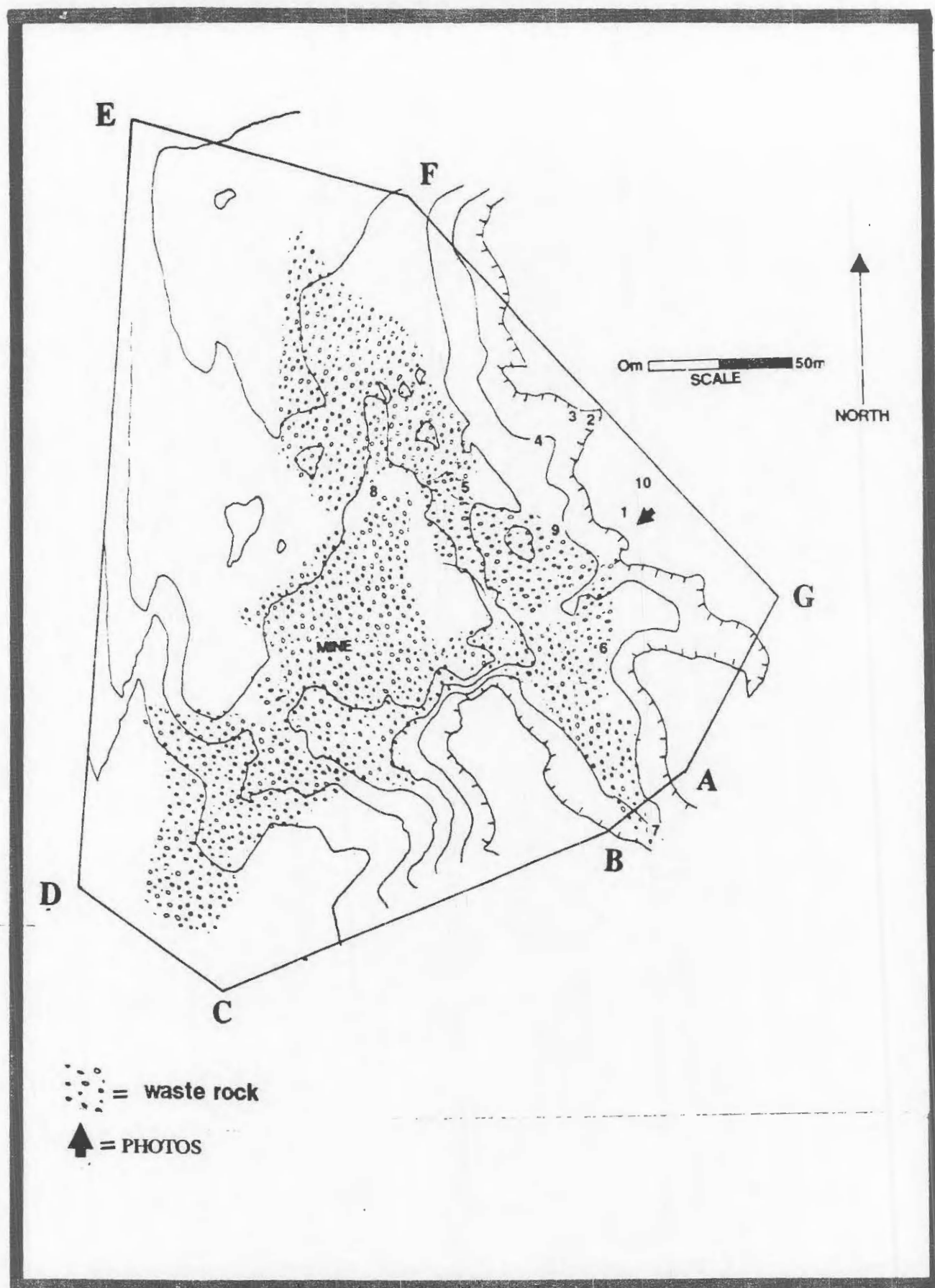


Figure 13. Specific Map Illustrating AZ-N-22-05 (NAMLRD # 79).

**AZ-N-22-06 (Figure 14)**

AML Project Area: 80

Mining Claim: Yazzie No. 2

Site Type: Uranium ore open pit mine

USGS Map Reference: Wupatki NE, Arizona, 7.5' min., 1969.

UTM Coordinates: CP A 3953000N, 472730E  
 CP B 3952930N, 472350E  
 CP C 3953200N, 472310E  
 CP D 3953300N, 472480E  
 CP E 3953390N, 472700E

Site Size: CP A-B 1203 ft. (366 m)  
 CP B-C 871 ft. (265 m)  
 CP C-D 664 ft. (202 m)  
 CP D-E 830 ft. (252 m)  
 CP E-A 1328 ft. (404 m)

Site Description: This site consists of a main pit and extensive waste ore/rock scattered throughout the project area. A main road transects the project area on the eastern portion as well as waste ore/rock. The main pit measures 415 ft. (126 m) in length and 166 ft. (56 m) in width. A major waste ore/rock pile is situated adjacent to the intersecting graded road and measures 996 ft. (305 m) long and 249 ft. (75 m) wide. The other major waste ore/rock pile lies 106 ft. (50 m) west of the main pit and is 747 ft. (227 m) long and 498 ft. (151 m) in width. Items inventoried during survey include:

1. 5 gal. oil can
2. clear glass fragments
3. aerosol can
4. aluminum can
5. 2 ft. steel cable
6. pop bottle
7. stake
  - 2 oil cans
8. glass fragments
9. circular metal
10. machinery metal
11. broken glass
  - plywood
  - rain boots
12. Budweiser can
13. wooden stake
14. metal teeth for machinery
15. crushed Budweiser can
16. Coors can
17. baling wire
18. crushed/rusted oil can
19. 1 ft. wire
20. rusted oil can (SAE 40 HD)
22. 3 rusted oil cans
24. coffee can (Farmer Brother Fine Quality Coffee)
26. milled lumber
28. aluminum scrap metal

Historical information documented was found in only one report:



...the strip pit is about 400 ft. square. Overburden is about 35 feet thick. Additional stripping since the last examination has sloped the high walls on about a 1 to 1 ratio. The ore is up to 5 ft. thick and at the time of examination a log about 16 inches in diameter had been uncovered over a distance of 32 ft. in the bottom of the pit. The log was the same diameter over the entire distance and the butt or top end could not be determined (McConnell April 10, 1958).

This mine was operated by the Foley Brothers Inc. and produced 5,646 tons between 1957-61.

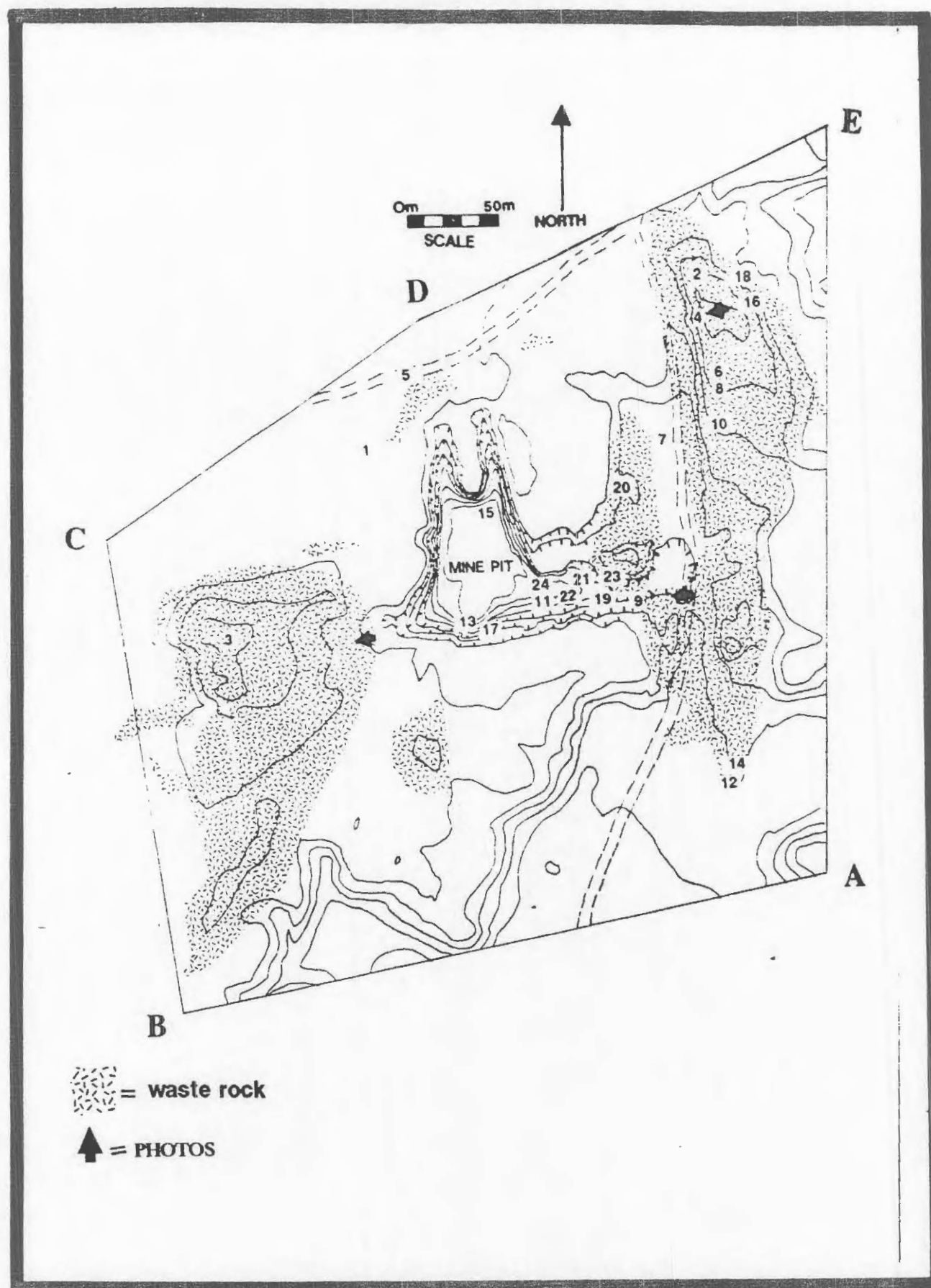


Figure 14. Specific Map Illustrating AZ-N-22-06 (NAMLRD # 80).

### SACRED PLACES

In order to determine the possibility of Traditional Cultural Properties (TCPs) that might be affected by the proposed construction, Grace Morgan of the Navajo Nation Archaeology Department - NAU Branch Office drove throughout the Cameron area and visited the homes closest to the uranium mines. Morgan's first language is Navajo, thus she easily communicated with the local residents, the Navajo politicians, and medicine men, of Cameron, Arizona. She interviewed individuals who have resided in the Cameron area for most, if not all of their lives, or who had personal knowledge about mining operations. A total of 51 residences and a Nazarene Church were visited and representatives of eighteen different families were interviewed. With the exception of 3 interviews, all research was conducted in the Navajo language. The most commonly expressed opinions were: 1) the interviewee was Christian and did not care about TCPs; 2) the interviewee did not know of any TCPs in the project area, 3) the interviewee indicated that the project area was "not being used for anything."

The Hopi tribe was also consulted regarding the presence of TCPs within or near the project area by Katherine Johnson, Hopi Archaeologist. Tribal representatives were unaware of any Hopi TCPs within a one kilometer radius of the project areas. However, the Hopi Tribe did express concern about two eagle nesting sites about three miles from the project areas. The Hopi Tribe requested that construction activity not take place during the springtime to avoid any disturbance of brooding eagles.

### CURRENTLY OCCUPIED/IN-USE STRUCTURES & FEATURES

No currently occupied or in-use structures or features occur in or within close proximity to any of the NAMLRD reclamation areas.

### SIGNIFICANCE EVALUATIONS

Each of the nine archaeological mine sites recorded during this project were evaluated for eligibility to the National Register of Historic Places (NRHP). None of the sites are eligible to the National Register under any criteria and all are less than 50 years old. In addition, lack of scientific interest and being less than 100 years old, none of the nine project areas are protected under Archaeological Resource Protection Act (ARPA). Furthermore, none of the sites qualify for protection under American Indian Religious Freedom Act (AIRFA), since they apparently do not have religious significance to Native Americans.

### RECOMMENDATIONS

The proposed reclamation work will not affect significant cultural resources. The uranium ore mine sites are not eligible for nomination to the National Register, nor do they warrant protection under ARPA and AIRFA. Thus, we recommend that NAMLRD proceed with their proposed reclamation as planned.

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- Scarborough, Robert  
1981 Radioactive Occurrences and Uranium Production in Arizona. Tucson: Arizona Bureau of Geology and Mineral Technology Geological Survey Branch.
- Schwennesen, Michael  
1989 Proposed CERCLA Expanded Site Inspection. San Francisco: Ecology and Environment, Inc. (April 10).
- Tuck, Frank (compiled by)  
1958-1962 "Mining, Examination (USGS), and Safety Inspection Reports." Copies on File, Abandoned Mine Lands Reclamation Department, Tuba City, Arizona.

## Appendix A

Navajo Nation Archaeology DepartmentSite Survey and Management FormSITE NO. :  
AZ-N-11-06FIELD OR OTHER NAME: NAMLRD #55a, b  
Charles Huskon No. 10DATE RECORDED:  
June 3, 1992PROJECT NUMBER & NAME: NNAD 92-146, An Archaeological Survey for the Proposed Reclamation of 9 Abandoned Uranium Mines in Cameron, Coconino County, Arizona.ORGANIZATION: NNAD-NAUARCHAEOLOGIST(S): Brady Two Bears,  
Davina BegayeUSGS 7.5' SERIES MAP REFERENCE: Cameron SE, Arizona 1988 Prov. EditionLEGAL LOCATION: T28N, R10ESE 1/4 SE 1/4 NW 1/4 Sec. 29UTM ZONE: 12,

a

CP A 3959220N, 468030E

CP B 3959380N, 467940E

CP C 3959600N, 498430E

CP D 3959520N, 498580E

b

CP A 3959480N, 468950E

CP B 3959660N, 468560E

CP C 3959750N, 468590E

CP D 3959640N, 468960E

STATE: ArizonaCOUNTY: CoconinoCHAPTER: CameronLAND STATUS: Navajo Tribal TrustGROUND VISIBILITY: 90-100%Kind and extent of cover? Low shrubs and grassTOPOGRAPHY: Rolling desert grasslands and sand dunesDRAINAGE: Little Colorado River 2,300 m eastELEVATION (FT/M): 4,317 ft./1,315 mSlope and Direction: VariableSOIL TYPE: Well sorted fine grained sandOTHER: Tolchaco gravelVEGETATION PRESENT: 2 wing saltbush, camelthorn, prickly pear, narrow leaf yucca, Russian thistle, tamarisk and various grasses.CULTURAL AFFILIATION(S): AngloSITE TYPE: Uranium open pit minePERIOD(S) OF OCCUPATION (Date, if known): 1950s-60sHOW DATED: Historic recordsDIMENSIONS OF SITE (l x w): (a) 2,085 ft./635 m x 675 ft./205 m Total Area (sq. m):

(b) 1,249 ft./380m x 352 ft./107 m 153,433 sq. m

How Determined: Compass and metric tapeARCHITECTURE PRESENT? Describe: No



ARTIFACTS OBSERVED/COUNTED: See Site Description

COLLECTION MADE: No

OF WHAT? N/A

METHOD: N/A

PHOTO TAKEN?

Yes

B/W:

N/A

Frame(s):

N/A

Color:

Yes

Roll:

undeveloped

Frame(s):

N/A

SITE DESCRIPTION: The site consists of one open uranium mine pits, waste ore piles, and associated historic trash. Site 55a consists of a 48 ft. (14 m) deep trench (SW-NE) 1,185 ft. (360 m) long and 237 ft. (72 m) wide. The main ore waste piles lie on the SW and NE parts of the project area. Trash consisted solely of historic trash. Site 55b consists of an adit that measures 10 ft. (3 m) deep, 264 ft. (80 m) long, and 88 ft. (27 m) wide. The main body of waste ore surrounds this adit, and a secondary pile is situated 616 ft. (187 m) west of the adit. Trash is comprised of historic trash. Items inventoried at 55a include:

1. rusted tin can
2. Roma wine bottle
3. aluminum foil
4. cardboard
5. 3 ft. metal bar
6. 2 oil cans
7. 2 oil cans  
2 ft. steel bar
8. barrel stove
9. food can/rusted piece of metal
10. wooden stake
11. rubber tube
12. crushed oil can
13. license plate
14. 2" screw/bottle
15. cable/5 gal. oil drum
16. steel pipe/oil can
17. 3 crushed oil cans
18. pull tab Dr. Pepper can
19. gas can
20. 2 oil cans  
3 pieces of metal
21. 2 pieces of rubber
22. 5 gal. gas can
23. piece of canvas
24. 3 crushed oil cans
25. 4 pieces of burnt metal

Items inventoried at 55b include:

1. wooden stake
2. Red Rock Cola bottle (ca. 1939)
3. food can
4. pop can
5. I.O.
6. 1" thick screw
7. pop can
8. orange juice can
9. food can
10. Kist bottle
11. tar paper

12. oil can
13. pull tab aluminum can
14. Natural Light beer can

Historic information was minimal except for descriptive progress reports concerning work on the mines. The mine was operated by the Rare Metals Corporation and produced 17.083 tons between 1953-61.

CONDITION OF SITE: Poor

Causes of disturbance: Erosion and littering

LOCATION OF SITE RELATIVE TO PROJECT AREA: Site is the project area

EXTENT OF INVESTIGATION TO DATE: This recording

RESEARCH POTENTIAL: None

RECOMMENDATIONS: Since this site is not Register eligible, we recommend that AMLRD proceed with their reclamation as planned.

SITE ASSESSMENT UNDER 36 CFR 60.4 (National Register):

INTEGRITY: Site contains integrity of location

and CRITERIA a-d: Site does not qualify under Criteria a-d and is not eligible for nomination to the National Register, as it lacks scientific research potential. Further investigation is unlikely to yield information important in local history.

EXCLUSIONS: Site is less than 50 years old.

SITE ASSESSMENT UNDER 43 CFR 7.3 (Archaeological Resources Protection Act):

Site is less than 100 years old and lacks scientific research potential, thus it is not protected under ARPA.

SITE ASSESSMENT UNDER AIRFA (American Indian Religious Freedom Act):

Site has no religious significance to extant Native Americans, thus does not merit protection under AIRFA.

PROVIDE A SITE MAP (including site designation, North arrow, scale, recognizable features, landmarks and relationship to project area).

HOW CAN SITE BE REACHED? (See attached U.S.G.S. map)

OTHER COMMENTS: None

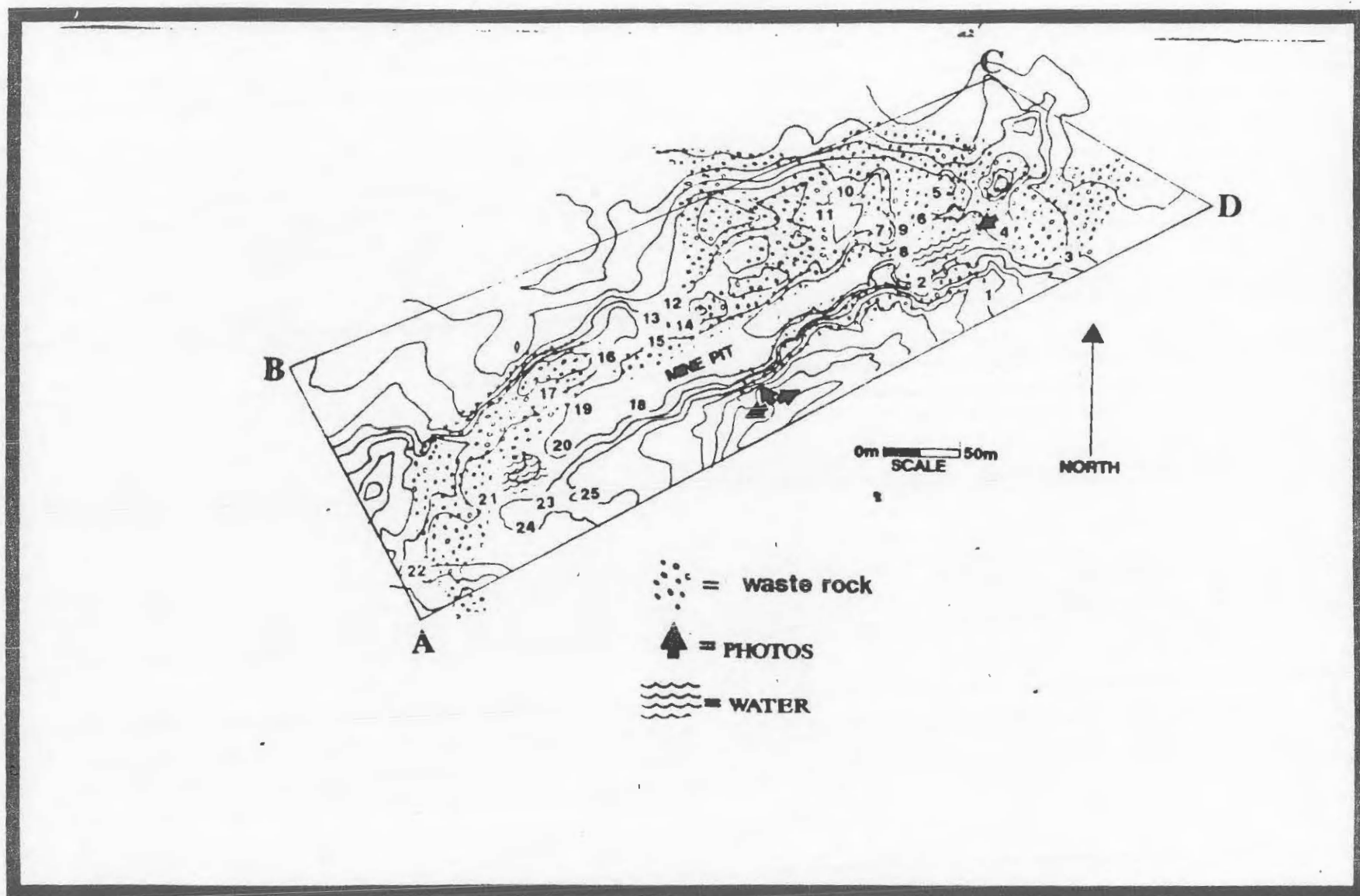


Figure 4. Specific Map Illustrating AZ-N-11-06 (NAMLRD # 55a).

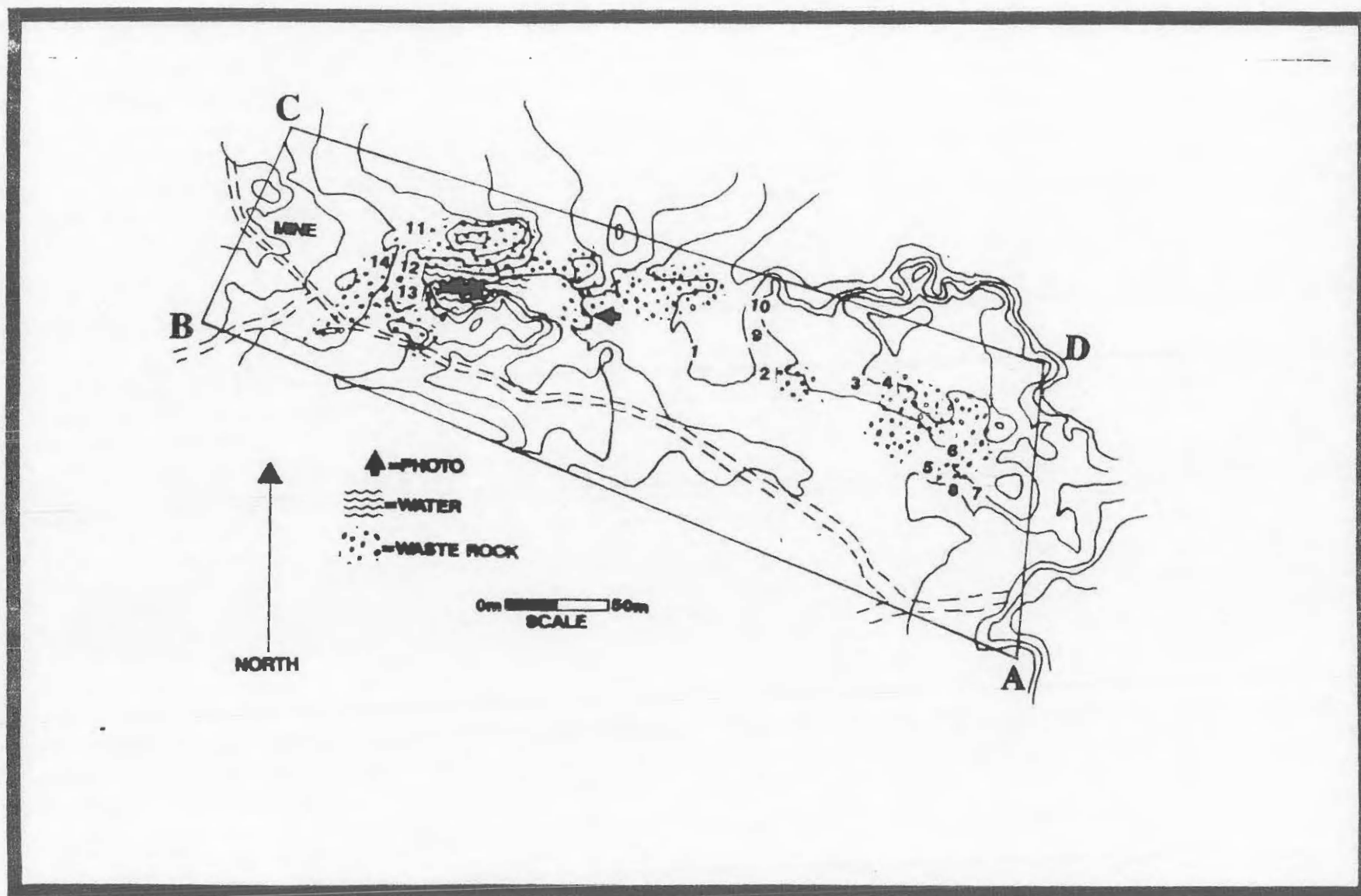


Figure 5. Specific Map Illustrating AZ-N-11-07 (NAMLRD # 55b).

Navaio Nation Archaeology Department

Site Survey and Management Form

SITE NO. : AZ-N-11-07      FIELD OR OTHER NAME: NAMLRD #63      DATE RECORDED: May 14, 1992  
                                          Ryan No. 1

PROJECT NUMBER & NAME: NNAD 92-146, An Archaeological Survey for the Proposed Reclamation of 9 Abandoned Uranium Mines in Cameron, Coconino County, Arizona.

ORGANIZATION: NNAD-NAU      ARCHAEOLOGIST(S): Brady Two Bears,  
                                          Davina Begaye

USGS 7.5' SERIES MAP REFERENCE: Cameron SE, Arizona 1988 Prov. Edition

LEGAL LOCATION: T28N, R10E (projected) unplatted

UTM ZONE: 12,      CP A 3956910N, 470780E  
                                          CP B 3957330N, 472220E  
                                          CP C 3957490N, 472320E  
                                          CP D 3957470N, 472410E

STATE: Arizona      COUNTY: Coconino      CHAPTER: Cameron

LAND STATUS: Navajo Tribal Trust

GROUND VISIBILITY: 90-100%      Kind and extent of cover? Low shrubs and grasses

TOPOGRAPHY: Rolling desert grasslands and sand dunes

DRAINAGE: Little Colorado River 1,000 m west

ELEVATION (FT/M): 4,240 ft./1,292 m      Slope and Direction: Variable

SOIL TYPE: Well sorted fine grained sand      OTHER: Tolchaco gravel

VEGETATION PRESENT: 2 wing saltbush, camelthorn, prickly pear, narrow leaf yucca, Russian thistle, tamarisk and various grasses.

CULTURAL AFFILIATION(S): Anglo      SITE TYPE: Uranium open pit mine

PERIOD(S) OF OCCUPATION (Date, if known): 1950s-60s      HOW DATED: Historic records

DIMENSIONS OF SITE (l x w): 607 ft./185 m x 526 ft./160 m      Total Area (sq. m):  
                                          30,392 sq. m

How Determined: Compass and metric tape

ARCHITECTURE PRESENT? Describe: No

ARTIFACTS OBSERVED/COUNTED: See Site Description

COLLECTION MADE: No      OF WHAT? N/A      METHOD: N/A

PHOTO TAKEN?      B/W:      Frame(s):      Color:      Roll:      Frame(s):  
                                          Yes      N/A      N/A      Yes      undeveloped      N/A

**SITE DESCRIPTION:** The site consists of one main open ore pit mine 18 ft. (5m) deep. The pit is oriented NE-SW and is 486 ft. (148 m) long and 202 ft. (61 m) in width. The majority of the waste ore and rock surrounds the open pit on all the sides except for the southwestern portion. Items inventoried during the survey include the following:

1. Glass bottle (unidentified)
2. Coors bottle
3. Budweiser Light can
4. various small cow bones
5. various small cow bones
6. 20 ft. water pipe
7. rusted oil can
8. 40 ft. & 20 ft. water pipe
9. crushed Coca-Cola can
10. diet Pepsi can
11. 17 oz. spray can
12. Genuine Draft beer can
14. scrap metal

Historical information for this mine is infrequent, but a description of the existing mine was included:

The strip pit opened is about 100 feet wide and 300 feet long. Overburden averages 25 ft. thick and the ore 3 ft. to 4 ft. thick. At the time of examination the Ryan No. 1 claim was being drilled by the permittee on close centers. No ore body has been found as yet (McConnell April 9, 1958).

The mine was operated by the Ryan Oil Corporation and produced 17, 083 tons between 1953-61.

**CONDITION OF SITE:** Poor

**Causes of disturbance:** Erosion and littering

**LOCATION OF SITE RELATIVE TO PROJECT AREA:** Site is the project area

**EXTENT OF INVESTIGATION TO DATE:** This recording

**RESEARCH POTENTIAL:** None

**RECOMMENDATIONS:** Since this site is not Register eligible, we recommend that AMLRD proceed with their reclamation as planned.

**SITE ASSESSMENT UNDER 36 CFR 60.4 (National Register):**

**INTEGRITY:** Site contains integrity of location

and **CRITERIA a-d:** Site does not qualify under Criteria a-d and is not eligible for nomination to the National Register, as it lacks scientific research potential. Further investigation is unlikely to yield information important in local history.

**EXCLUSIONS:** Site is less than 50 years old.

**SITE ASSESSMENT UNDER 43 CFR 7.3 (Archaeological Resources Protection Act):**

Site is less than 100 years old and lacks scientific research potential, thus it is not protected under ARPA.

**SITE ASSESSMENT UNDER AIRFA (American Indian Religious Freedom Act):**

Site has no religious significance to extant Native Americans, thus does not merit protection under AIRFA.



PROVIDE A SITE MAP (including site designation, North arrow, scale, recognizable features, landmarks and relationship to project area).

HOW CAN SITE BE REACHED? (See attached U.S.G.S. map)

OTHER COMMENTS: None

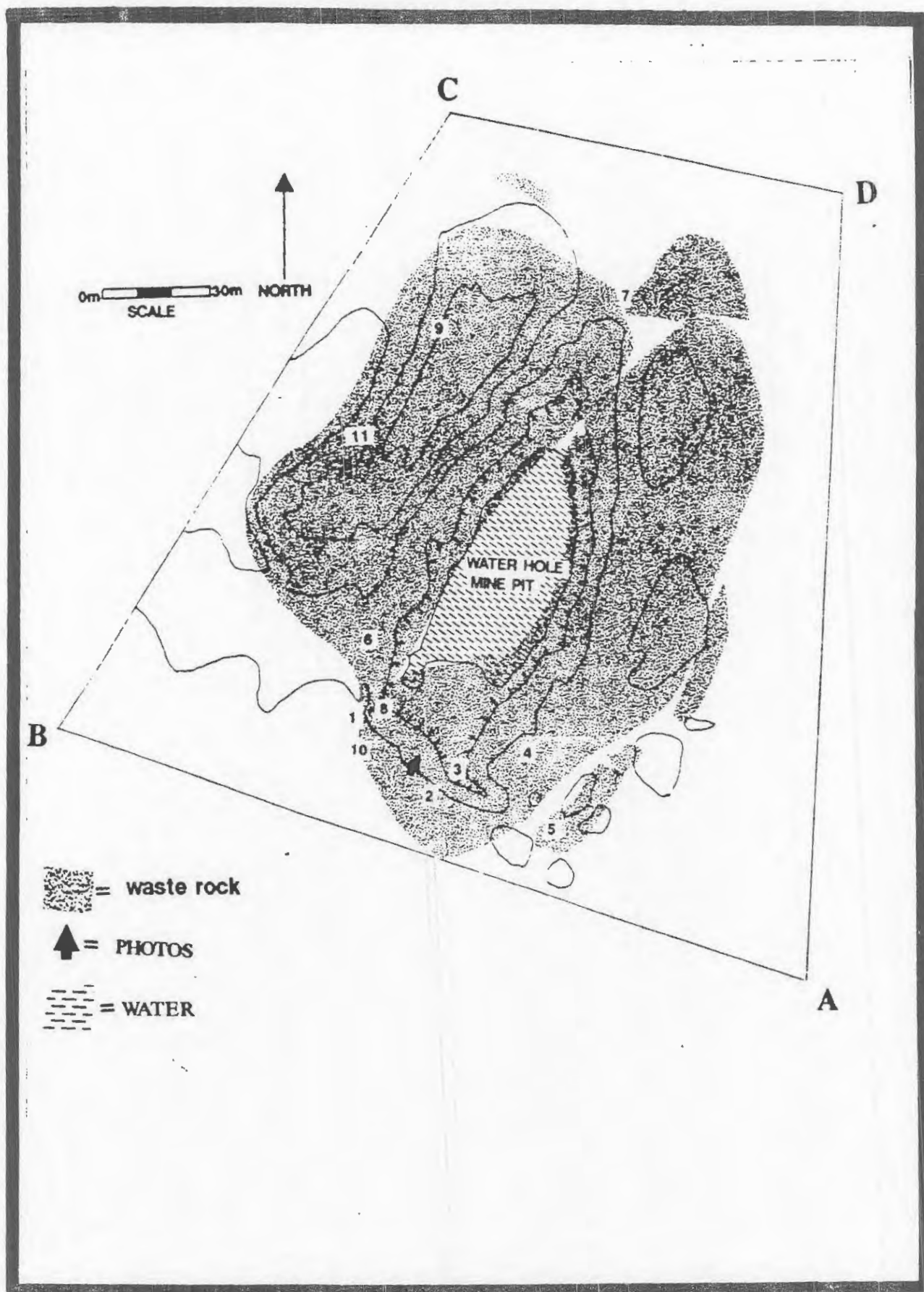


Figure 6. Specific Map Illustrating AZ-N-11-07 (NAMLRD # 63).

Navajo Nation Archaeology DepartmentSite Survey and Management FormSITE NO. :  
AZ-N-11-08FIELD OR OTHER NAME: NAMLRD #66  
Charles Huskorn No. 11DATE RECORDED:  
May 1, 1992PROJECT NUMBER & NAME: NNAD 92-146, An Archaeological Survey for the Proposed  
Reclamation of 9 Abandoned Uranium Mines in Cameron, Coconino County, Arizona.ORGANIZATION: NNAD-NAUARCHAEOLOGIST(S): Brady Two Bears,  
Davina BegayeUSGS 7.5' SERIES MAP REFERENCE: Cameron SE, Arizona 1968LEGAL LOCATION: T28N, R10E SW 1/4 SE 1/4 SE 1/4 Sec. 33UTM ZONE: 12,

CP A 3956910N, 470780E

CP B 3956850N, 470740E

CP C 3956860N, 470460E

CP D 3957030N, 470390E

CP E 3957230N, 470550E

STATE: ArizonaCOUNTY: CoconinoCHAPTER: CameronLAND STATUS: Navajo Tribal TrustGROUND VISIBILITY: 90-100%Kind and extent of cover? Low shrubs and grassesTOPOGRAPHY: Rolling desert grasslands and sand dunesDRAINAGE: Little Colorado River 500 m eastELEVATION (FT/M): 4,189 ft./1,276 mSlope and Direction: VariableSOIL TYPE: Well sorted fine grained sandOTHER: Tolchaco gravelVEGETATION PRESENT: 2 wing saltbush, camelthorn, prickly pear, narrow leaf yucca, Russian  
thistle, tamarisk and various grasses.CULTURAL AFFILIATION(S): AngloSITE TYPE: Uranium open pit minePERIOD(S) OF OCCUPATION (Date, if known): 1950s-60sHOW DATED: Historic recordsDIMENSIONS OF SITE (l x w): 1,489 ft./450 m x 1,218 ft./371 mTotal Area (sq. m):  
102,610 sq. mHow Determined: Compass and metric tapeARCHITECTURE PRESENT? Describe: NoARTIFACTS OBSERVED/COUNTED: See Site DescriptionCOLLECTION MADE: NoOF WHAT? N/AMETHOD: N/A

<u>PHOTO TAKEN?</u>	<u>B/W:</u>	<u>Frame(s):</u>	<u>Color:</u>	<u>Roll:</u>	<u>Frame(s):</u>
Yes	N/A	N/A	Yes	undeveloped	N/A

SITE DESCRIPTION: The site consists of a main pit (NE-SW) that is 24 ft. (7 m) deep and 522 ft. (159 m) in length and 87 ft. (26 m) wide. Waste ore piles lie on the SE edge of the main pit, 87 ft. (26 m) west of the main pit, and two concentrations north and east of the main pit. The southern boundary of the site is the fence line that separates the Navajo Reservation and the Cobon Ranch. Historic trash such as rusted oil cans, rusted aluminum cans, broken glass, a car seat, wire, and various modern historic trash (dated through cans and glass). The presence of ash/charcoal stains throughout the project was noted by project archaeologists, but the origin is unknown. A list of historical items is as follows:

1. rusted can lid
2. rusted machine metal
3. rubber strap
4. AZ License plate (6684-P)
5. rusted tin can
6. rusted oil can
7. rusted oil can
8. 2 oil cans  
broken glass (Folgers)
9. rusted cable
10. burned trash basket  
pull tab aluminum can  
church key aluminum can
11. 1 1/2 ft. wire
12. car seat
13. rusted aluminum can, wire
14. 5 gallon gas can
15. 3 rusted, smashed oil cans
16. 7-Up bottle
17. 5 gallon rusted can
18. Coors can

Historical information for this mine states that no mining was conducted at this mine since July 1, 1959. This mine was also the largest source in the Cameron area from this particular member (McConnell March 16, 1960 & Scarborough March, 1981). The mine was operated by the Rare Metals Corporation and produced 2,747 tons between 1958-69.

CONDITION OF SITE: Poor

Causes of disturbance: Erosion and littering

LOCATION OF SITE RELATIVE TO PROJECT AREA: Site is the project area

EXTENT OF INVESTIGATION TO DATE: This recording

RESEARCH POTENTIAL: None

RECOMMENDATIONS: Since this site is not Register eligible, we recommend that AMLRD proceed with their reclamation as planned.

SITE ASSESSMENT UNDER 36 CFR 60.4 (National Register):

INTEGRITY: Site contains integrity of location

and CRITERIA a-d: Site does not qualify under Criteria a-d and is not eligible for nomination to the National Register, as it lacks scientific research potential. Further investigation is unlikely to

HOW CAN SITE BE REACHED? (See attached U.S.G.S. map)

OTHER COMMENTS: None

<u>PHOTO TAKEN?</u>	<u>B/W:</u>	<u>Frame(s):</u>	<u>Color:</u>	<u>Roll:</u>	<u>Frame(s):</u>
Yes	N/A	N/A	Yes	undeveloped	N/A

SITE DESCRIPTION: The site consists of 30 ft. deep trench/pit that is 558 ft. (170 m) in length and 186 ft. (56 m) wide. The waste ore/rock is located mainly on the eastern portion of the main pit.

Items inventoried at the project area include:

1. old cardboard pieces in landfill
2. rusted decayed oil can
3. radiator piece  
barrel cover  
50 +/- chopped pieces of wire (75 ft.)  
cow bones (2 +)  
rusted smashed oil can  
milled lumber
4. cow rib bones (2 +)
5. 2 stake pieces
6. wooden stake

Historical information indicate that production from this mine stopped February, 1958. Only 20 tons of 0.29 percent ore were produced from this pit (McConnell May 10, 1961 & McConnell March 6, 1960). This mine was operated by the Rare Metals Corporation and produced 16,609 tons between 1956-59.

CONDITION OF SITE: Poor

Causes of disturbance: Erosion and littering

LOCATION OF SITE RELATIVE TO PROJECT AREA: Site is the project area

EXTENT OF INVESTIGATION TO DATE: This recording

RESEARCH POTENTIAL: None

RECOMMENDATIONS: Since this site is not Register eligible, we recommend that AMLRD proceed with their reclamation as planned.

SITE ASSESSMENT UNDER 36 CFR 60.4 (National Register):

INTEGRITY: Site contains integrity of location

and CRITERIA a-d: Site does not qualify under Criteria a-d and is not eligible for nomination to the National Register, as it lacks scientific research potential. Further investigation is unlikely to yield information important in local history.

EXCLUSIONS: Site is less than 50 years old.

SITE ASSESSMENT UNDER 43 CFR 7.3 (Archaeological Resources Protection Act):

Site is less than 100 years old and lacks scientific research potential, thus it is not protected under ARPA.

SITE ASSESSMENT UNDER AIRFA (American Indian Religious Freedom Act):

Site has no religious significance to extant Native Americans, thus does not merit protection under AIRFA.

PROVIDE A SITE MAP (including site designation, North arrow, scale, recognizable features, landmarks and relationship to project area).



Navajo Nation Archaeology DepartmentSite Survey and Management FormSITE NO. :  
AZ-N-22-02FIELD OR OTHER NAME: NAMLRD #73  
RAMCO No. 22DATE RECORDED:  
May 4 & 13, 1992PROJECT NUMBER & NAME: NNAD 92-146, An Archaeological Survey for the Proposed Reclamation of 9 Abandoned Uranium Mines in Cameron, Coconino County, Arizona.ORGANIZATION: NNAD-NAUARCHAEOLOGIST(S): Brady Two Bears,  
Davina BegayeUSGS 7.5' SERIES MAP REFERENCE: Wupatki NE, Arizona 1969LEGAL LOCATION: T27N, R10E (projected) unplattedUTM ZONE: 12,CP A 3954830N, 473680E  
CP B 3954720N, 473300E  
CP C 3954860N, 473150E  
CP D 3955020N, 473250E  
CP E 3954980N, 473510ESTATE: ArizonaCOUNTY: CoconinoCHAPTER: CameronLAND STATUS: Navajo Tribal TrustGROUND VISIBILITY: 90-100%Kind and extent of cover? Low shrubs and grasses.TOPOGRAPHY: Flood plainDRAINAGE: Unnamed ephemeral wash 100 m southeastELEVATION (FT/M): 4,184 ft./1,275 mSlope and Direction: VariableSOIL TYPE: Well sorted fine grained sandOTHER: Tolchaco gravelVEGETATION PRESENT: 2 wing saltbush, camelthorn, prickly pear, narrow leaf yucca, hairy cactus, sage, Russian thistle, tamarisk and various grasses.CULTURAL AFFILIATION(S): AngloSITE TYPE: Uranium open pit minePERIOD(S) OF OCCUPATION (Date, if known): 1950s-60sHQW DATED: Historic recordsDIMENSIONS OF SITE (l x w): 1,674 ft./510 m x 883 ft./269 mTotal Area (sq. m):  
81,962 sq. mHow Determined: Compass and metric tapeARCHITECTURE PRESENT? Describe: N/AARTIFACTS OBSERVED/COUNTED: See Site DescriptionCOLLECTION MADE: NoOF WHAT? N/AMETHOD: N/A

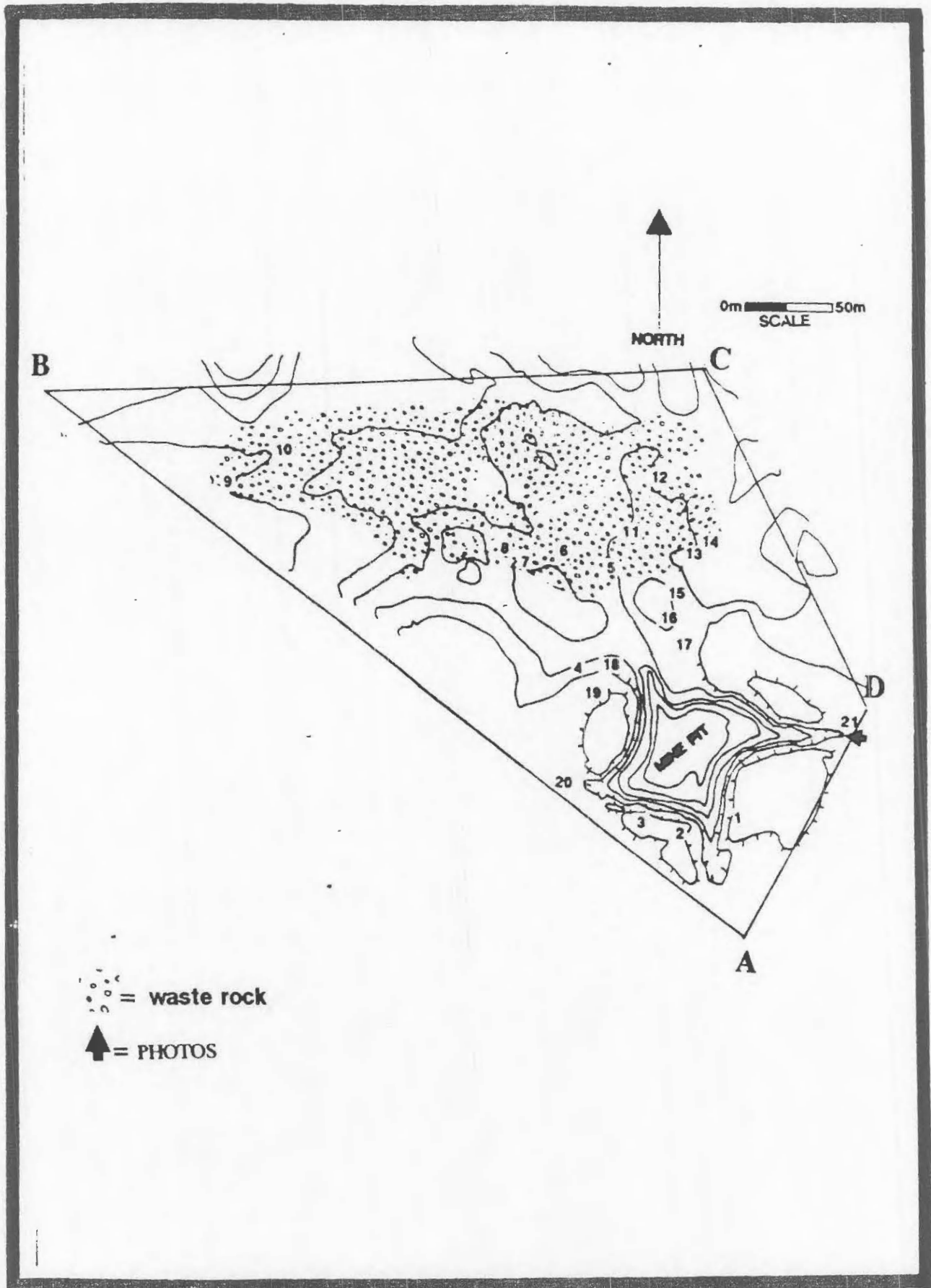


Figure 9. Specific Map Illustrating AZ-N-22-01 (NAMLRD # 72b).

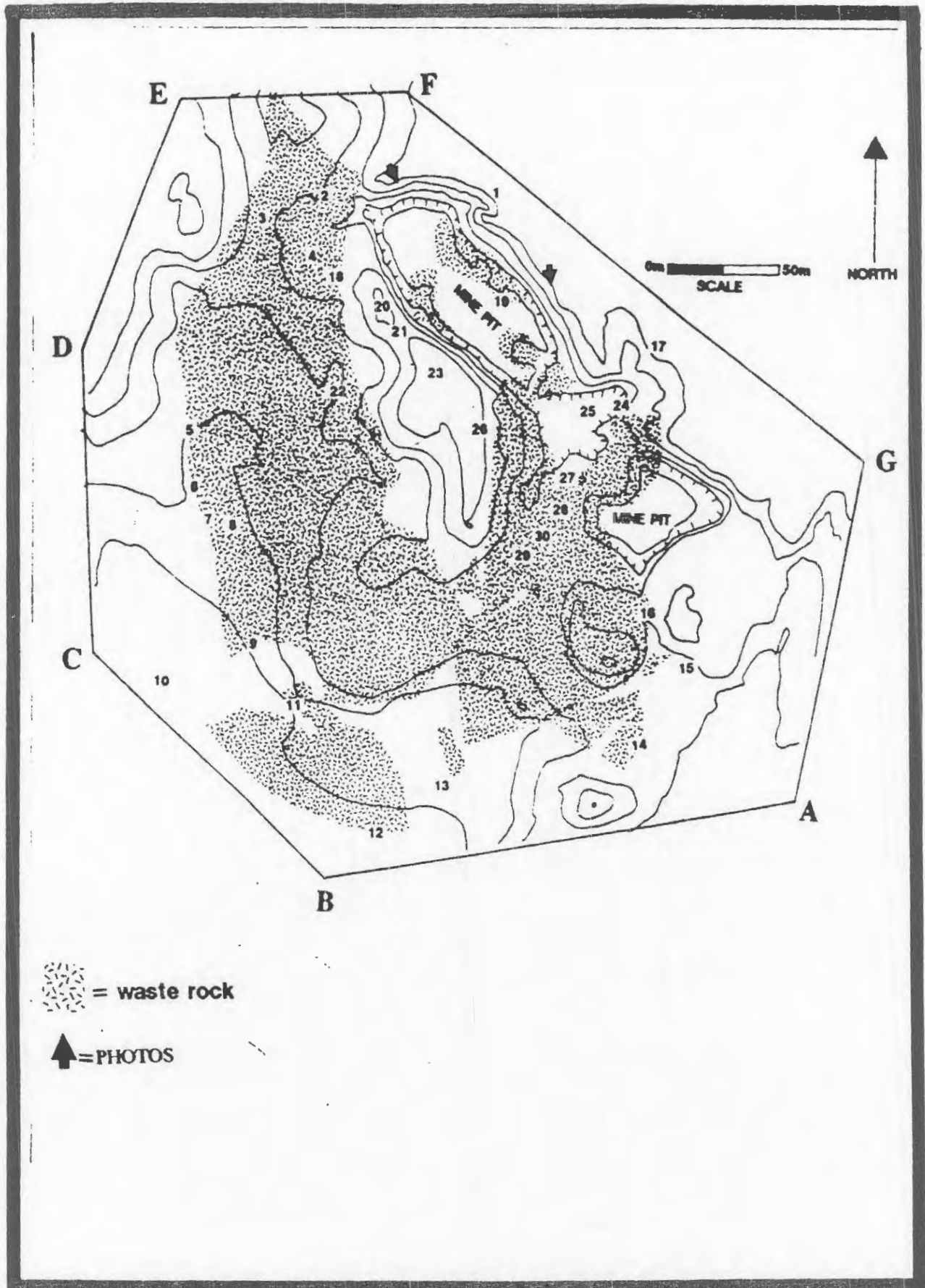


Figure 8. Specific Map Illustrating AZ-N-22-01 (NAMLRD # 72a).

9. Cragmont Cola can
10. Bud Dry can
11. rusted piece of pipe
12. cow bone
13. rusted oil can
14. wooden stake
15. wooden stake
16. wooden stake
17. wooden stake
18. wooden stake
19. oil can
20. plywood pieces
21. oil can

Historic information on this mine was limited to mine inspection reports. McConnell reported that no production took place since June 1958 and that the dimensions of the claim was "rectangular in shape and contains 126.0 acres. A pit 300 ft. long and 200 ft. wide, averages about 20 feet deep, and the ore is found in three small areas in the bottom of the pit and is 3 to 4 feet thick" (McConnell 1957 May 28). The mine was operated by the Rare Metals Corporation and produced 3,171 tons between 1956-59.

CONDITION OF SITE: Poor

Causes of disturbance: Erosion and littering

LOCATION OF SITE RELATIVE TO PROJECT AREA: Site is the project area

EXTENT OF INVESTIGATION TO DATE: This recording

RESEARCH POTENTIAL: None

RECOMMENDATIONS: Since this site is not Register eligible, we recommend that AMLRD proceed with their reclamation as planned.

SITE ASSESSMENT UNDER 36 CFR 60.4 (National Register):

INTEGRITY: Site contains integrity of location

and CRITERIA a-d: Site does not qualify under Criteria a-d and is not eligible for nomination to the National Register, as it lacks scientific research potential. Further investigation is unlikely to yield information important in local history.

EXCLUSIONS: Site is less than 50 years old.

SITE ASSESSMENT UNDER 43 CFR 7.3 (Archaeological Resources Protection Act):

Site is less than 100 years old and lacks scientific research potential, thus it is not protected under ARPA.

SITE ASSESSMENT UNDER AIRFA (American Indian Religious Freedom Act):

Site has no religious significance to extant Native Americans, thus does not merit protection under AIRFA.

PROVIDE A SITE MAP (including site designation, North arrow, scale, recognizable features, landmarks and relationship to project area).

HOW CAN SITE BE REACHED? (See attached U.S.G.S. map)

OTHER COMMENTS: None

ARCHITECTURE PRESENT? Describe: N/A

ARTIFACTS OBSERVED/COUNTED: See Site Description

COLLECTION MADE: No

OF WHAT? N/A

METHOD: N/A

PHOTO TAKEN?

Yes

B/W:

N/A

Frame(s):

N/A

Color:

Yes

Roll:

undeveloped

Frame(s):

N/A

SITE DESCRIPTION: The site consists of 2 open uranium mine pits, waste ore piles, modern trash, and associated historic trash. Site 72a consists of a trench (NW-SE) that is 40 ft. (12 m) deep and 246 ft. (74 m) in length. An adit is situated SE of the main trench and is 24 ft. (7 m) deep. Protore and waste rock piles lie between the trench and the adit and south of the adit. Site 72b consist of a small pit that measures 40 ft. (12 m) deep, (NW-SE) 350 ft. (106 m) in length, and (NE-SW) 481 ft. (146 m) in width. Trash includes: Budweiser beer cans, wooden stakes, various soda cans (root beer, Pepsi, and Coke), a dead cow, metal fragments, +/- 50 ft. rusted cable, and a rusted 5 gal. can. Items inventoried at 72a include:

1. 1 ft. rusted cable wire
2. wooden stake
3. wooden stake
4. Budweiser pull tab can
5. Barq's Root Beer can
6. wooden stake
7. Miller Lite can
8. Pepsi can
9. Budweiser can
10. Budweiser can
11. Budweiser can
12. Pepsi pull tab can
13. Budweiser can
14. cow skull
15. 5 gal. rusted gas can
16. 2 (possible) cow bones
17. rusted Ford can
18. wooden stake
19. 3 ft. long rusted connector bar
20. wooden stake
21. wooden stake
22. wooden stake
23. wooden stake
24. dead cow
25. Styrofoam ice chest lid
26. wooden stake
27. rusted cylinder

Items inventoried at 72b include:

1. 2 rusted metal oil cans
2. 1 ft. long stake
3. crushed commodity food can
4. 1 crushed metal oil can
5. rusted food can
6. crushed metal oil can
7. oil filter
8. oil filter



Navaio Nation Archaeology Department

## Site Survey and Management Form

SITE NO. :  
AZ-N-22-01

FIELD OR OTHER NAME: NAMLRD #72a, b  
RAMCO No. 21

DATE RECORDED:  
May 4, 1992

**PROJECT NUMBER & NAME:** NNAD 92-146, An Archaeological Survey for the Proposed Reclamation of 9 Abandoned Uranium Mines in Cameron, Coconino County, Arizona.

ORGANIZATION: NNAD-NAU

ARCHAEOLOGIST(S): Brady Two Bears,  
Davina Begave

USGS 7.5' SERIES MAP REFERENCE: Wupatki NE, Arizona 1969

LEGAL LOCATION: T27N, R10E (projected) unplatted

UTM ZONE: 12,                      a                      CP A 3954800N, 472910E  
CP B 3954750N, 472700E  
CP C 3954940N, 472600E  
CP D 3954980N, 472600E  
CP E 3955100N, 472640E  
CP F 3955100N, 472720E  
CP G 3954900N, 472920E

**b** CP A 3954950N, 472940E  
CP B 3955260N, 472940E  
CP C 3955280N, 472920E  
CP D 3955080N, 473020E

STATE: Arizona

COUNTY: Coconino

**CHAPTER: Cameron**

LAND STATUS: Navajo Tribal Trust

GROUND VISIBILITY: 90-100%

Kind and extent of cover? Low shrubs and grasses

**TOPOGRAPHY:** Flood plain

**DRAINAGE:** Unnamed ephemeral wash 420 m southwest

ELEVATION (FT/M): 4,240 ft./1,292 m

### Slope and Direction: Variable

SOIL TYPE: Well sorted fine grained sand

OTHER: Tolchaco gravel

VEGETATION PRESENT: 2 wing saltbush, camelthorn, prickly pear, narrow leaf yucca, Russian thistle, tamarisk and various grasses.

CULTURAL AFFILIATION(S): Anglo

**SITE TYPE:** Uranium open pit mine

PERIOD(S) OF OCCUPATION (Date, if known): 1950s-60s

**HOW DATED:**Historic records

DIMENSIONS OF SITE (l x w): (a) 1,353 ft./412 m x 922 ft./281 m Total Area (sq. m):  
(b) 1,706 ft./519 m x 787 ft./239 m 137,770 sq. m

**How Determined:** Compass and metric tape



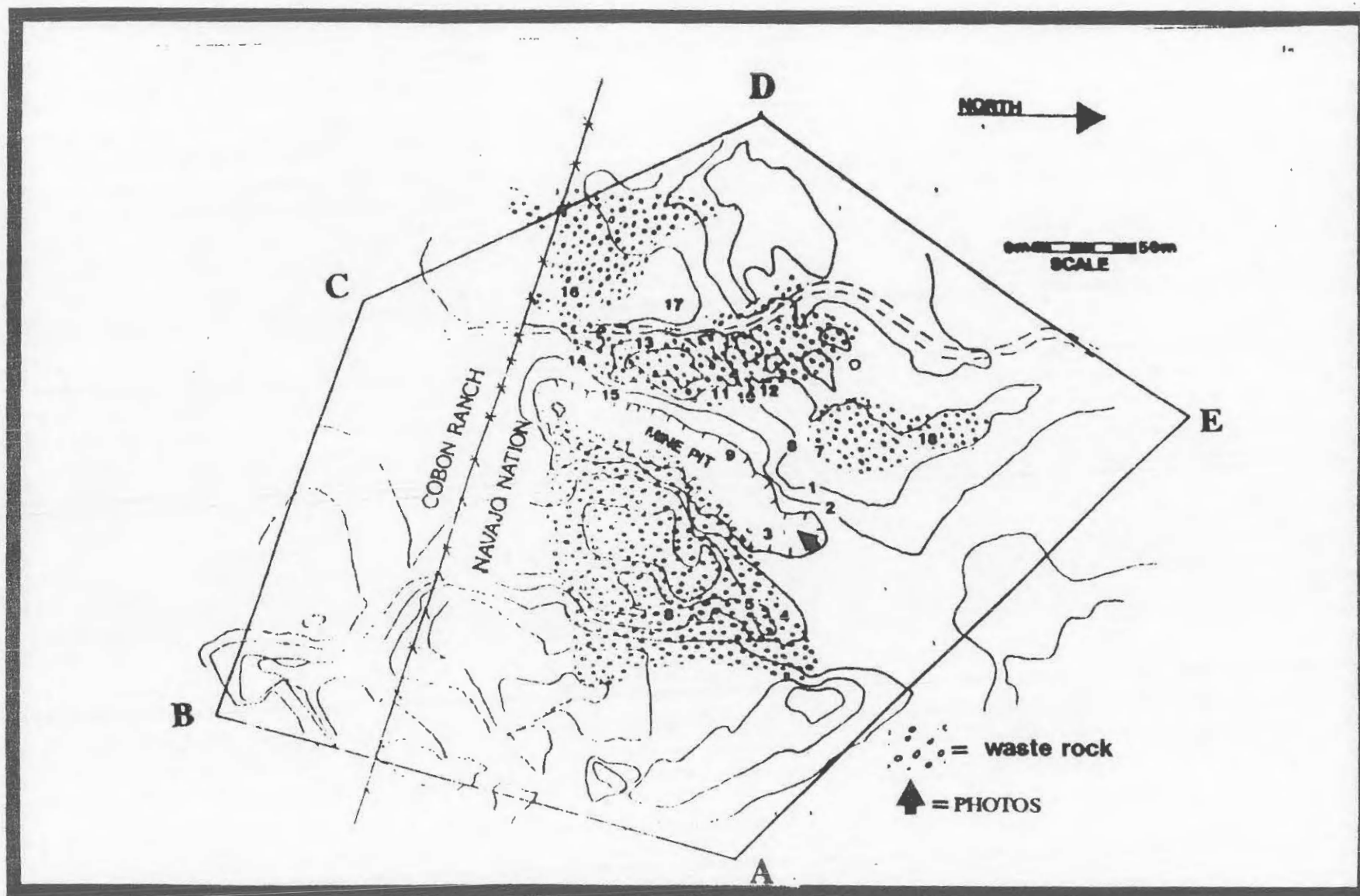


Figure 7. Specific Map Illustrating AZ-N-11-08 (NAMLRD # 66).

yield information important in local history.

EXCLUSIONS: Site is less than 50 years old.

SITE ASSESSMENT UNDER 43 CFR 7.3 (Archaeological Resources Protection Act):

Site is less than 100 years old and lacks scientific research potential, thus it is not protected under ARPA.

SITE ASSESSMENT UNDER AIRFA (American Indian Religious Freedom Act):

Site has no religious significance to extant Native Americans, thus does not merit protection under AIRFA.

PROVIDE A SITE MAP (including site designation, North arrow, scale, recognizable features, landmarks and relationship to project area).

HOW CAN SITE BE REACHED? (See attached U.S.G.S. map)

OTHER COMMENTS: None

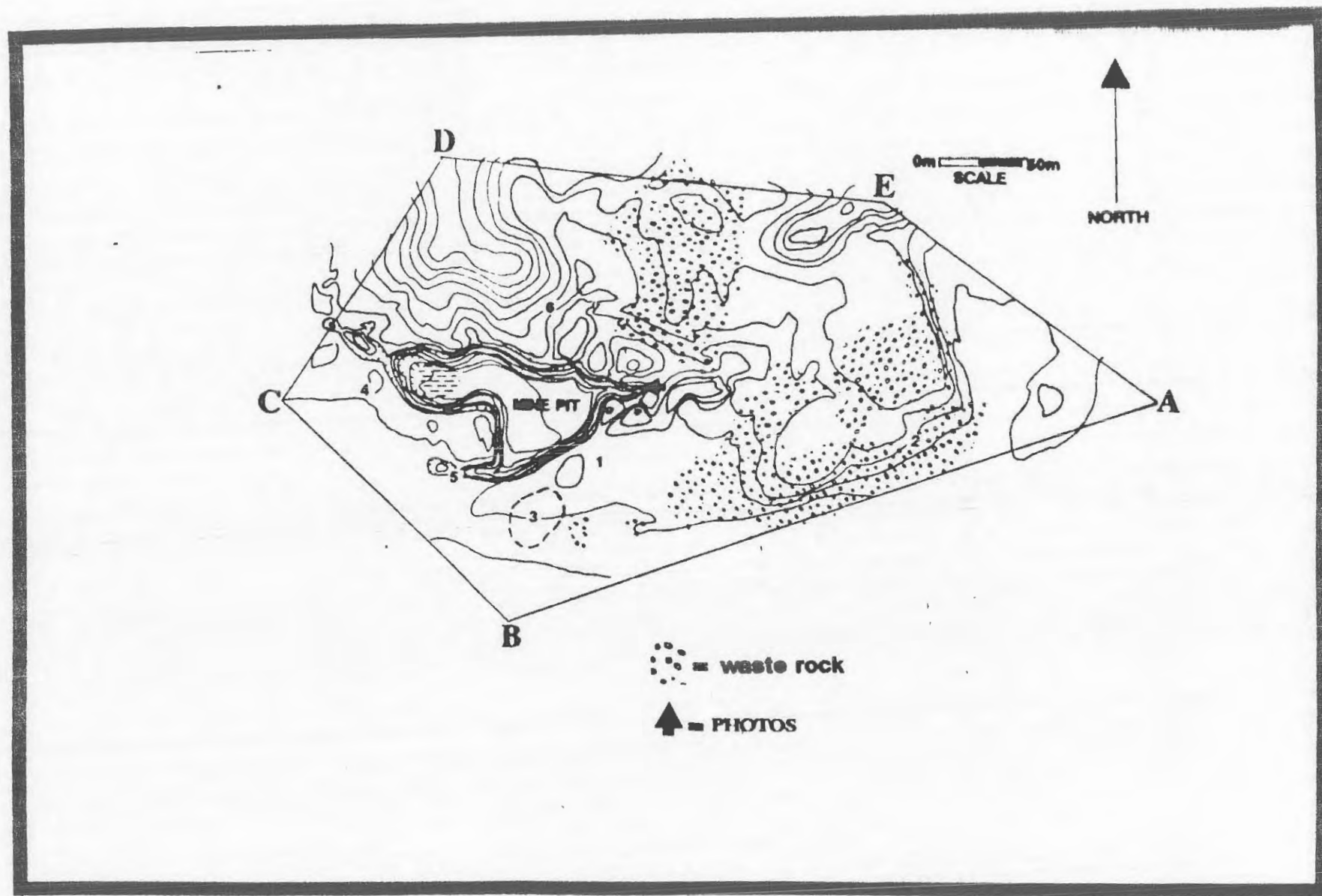


Figure 10. Specific Map Illustrating AZ-N-22-02 (NAMLRD # 73).

Navajo Nation Archaeology DepartmentSite Survey and Management Form

SITE NO. : FIELD OR OTHER NAME: NAMLRD #74 DATE RECORDED:  
 AZ-N-22-03 RAMCO No. 20 May 13, 1992

PROJECT NUMBER & NAME: NNAD 92-146, An Archaeological Survey for the Proposed Reclamation of 9 Abandoned Uranium Mines in Cameron, Coconino County, Arizona.

ORGANIZATION: NNAD-NAU ARCHAEOLOGIST(S): Brady Two Bears,  
 Davina Begaye

USGS 7.5' SERIES MAP REFERENCE: Wupatki NE, Arizona 1969

LEGAL LOCATION: T27N, R10E (projected) unplatted

UTM ZONE: 12, CP A 3954480N, 473090E  
 CP B 3954700N, 472960E  
 CP C 3954800N, 473020E  
 CP D 3954840N, 473130E  
 CP E 3954720N, 473240E

STATE: Arizona COUNTY: Coconino CHAPTER: Cameron

LAND STATUS: Navajo Tribal Trust

GROUND VISIBILITY: 90-100% Kind and extent of cover? Low shrubs and grasses

TOPOGRAPHY: Flood plain

DRAINAGE: Unnamed ephemeral wash 80 m south

ELEVATION (FT/M): 4,100 ft./1,249 m Slope and Direction: Variable

SOIL TYPE: Well sorted fine grained sand OTHER: Tolchaco gravel

VEGETATION PRESENT: 2 wing saltbush, camelthorn, prickly pear, narrow leaf yucca, Russian thistle, tamarisk and various grasses.

CULTURAL AFFILIATION(S): Anglo SITE TYPE: Uranium open pit mine

PERIOD(S) OF OCCUPATION (Date, if known): 1950s-60s HOW DATED: Historic records

DIMENSIONS OF SITE (l x w): 1,224 ft./373 m x 986 ft./300 m Total Area (sq. m):  
 61,133 sq. m

How Determined: Compass and metric tape

ARCHITECTURE PRESENT? Describe: N/A

ARTIFACTS OBSERVED/COUNTED: See Site Description

COLLECTION MADE: No OF WHAT? N/A METHOD: N/A

<b>PHOTO TAKEN?</b>	<b>B/W:</b>	<b>Frame(s):</b>	<b>Color:</b>	<b>Roll:</b>	<b>Frame(s):</b>
Yes	N/A	N/A	Yes	undeveloped	N/A

**SITE DESCRIPTION:** Site consists of two pits that are being used as watering holes by local cattle. The main ore waste piles lie on the southwest portion of the mine and interspersed throughout the southern and middle portions between the two main open mine pits. The eastern pit is 340 ft. (103 m) long and 204 ft. (62 m) long. The western pit is 476 ft. (145 m) long and 204 ft. (62 m) long. Both pits are oriented NW-SE. The two pits average a depth of 20 ft. (6 m). Items inventoried at this mine include:

1. 2 pieces of cable wire (7 ft. & 5 ft.)
2. 1 piece of cable wire (3 ft.)
3. cow bones
4. cow bones
5. 15 ft. cable
6. 50 ft. cable
7. 5 gal. rusted/smashed can
8. piece of rusted/smashed can
9. 30 ft. cable
10. cardboard box
11. cow bone
12. cow bone
13. 2 pieces of milled lumber
14. Milwaukee Beer cardboard case
15. wooden stake
16. Coors Light beer bottle
17. 2 cow bones
18. cow hoof
19. rusted piece of metal
20. Coors Light beer bottle
21. cow skull
22. 2 jaw bones w/ teeth
23. scatter of bones (8 +/-)
24. stake piece

Historical accounts for this mine indicate that there had been no production in this mine since June 1958, but that 20 tons of 0.26 percent  $U_3O_8$  ore had been produced from this mine. Other historical information has been minimal (McConnell March 16, 1960, October 14, 1958, & May 28, 1957). This mine was operated by the Rare Metals Corporation and produced 22,642 tons between 1956-60.

**CONDITION OF SITE:** Poor

**Causes of disturbance:** Erosion and littering

**LOCATION OF SITE RELATIVE TO PROJECT AREA:** Site is the project area

**EXTENT OF INVESTIGATION TO DATE:** This recording

**RESEARCH POTENTIAL:** None

**RECOMMENDATIONS:** Since this site is not Register eligible, we recommend that AMLRD proceed with their reclamation as planned.

**SITE ASSESSMENT UNDER 36 CFR 60.4 (National Register):**

**INTEGRITY:** Site contains integrity of location

and CRITERIA a-d: Site does not qualify under Criteria a-d and is not eligible for nomination to the National Register, as it lacks scientific research potential. Further investigation is unlikely to yield information important in local history.

EXCLUSIONS: Site is less than 50 years old.

SITE ASSESSMENT UNDER 43 CFR 7.3 (Archaeological Resources Protection Act):

Site is less than 100 years old and lacks scientific research potential, thus it is not protected under ARPA.

SITE ASSESSMENT UNDER AIRFA (American Indian Religious Freedom Act):

Site has no religious significance to extant Native Americans, thus does not merit protection under AIRFA.

PROVIDE A SITE MAP (including site designation, North arrow, scale, recognizable features, landmarks and relationship to project area).

HOW CAN SITE BE REACHED? (See attached U.S.G.S. map)

OTHER COMMENTS: None



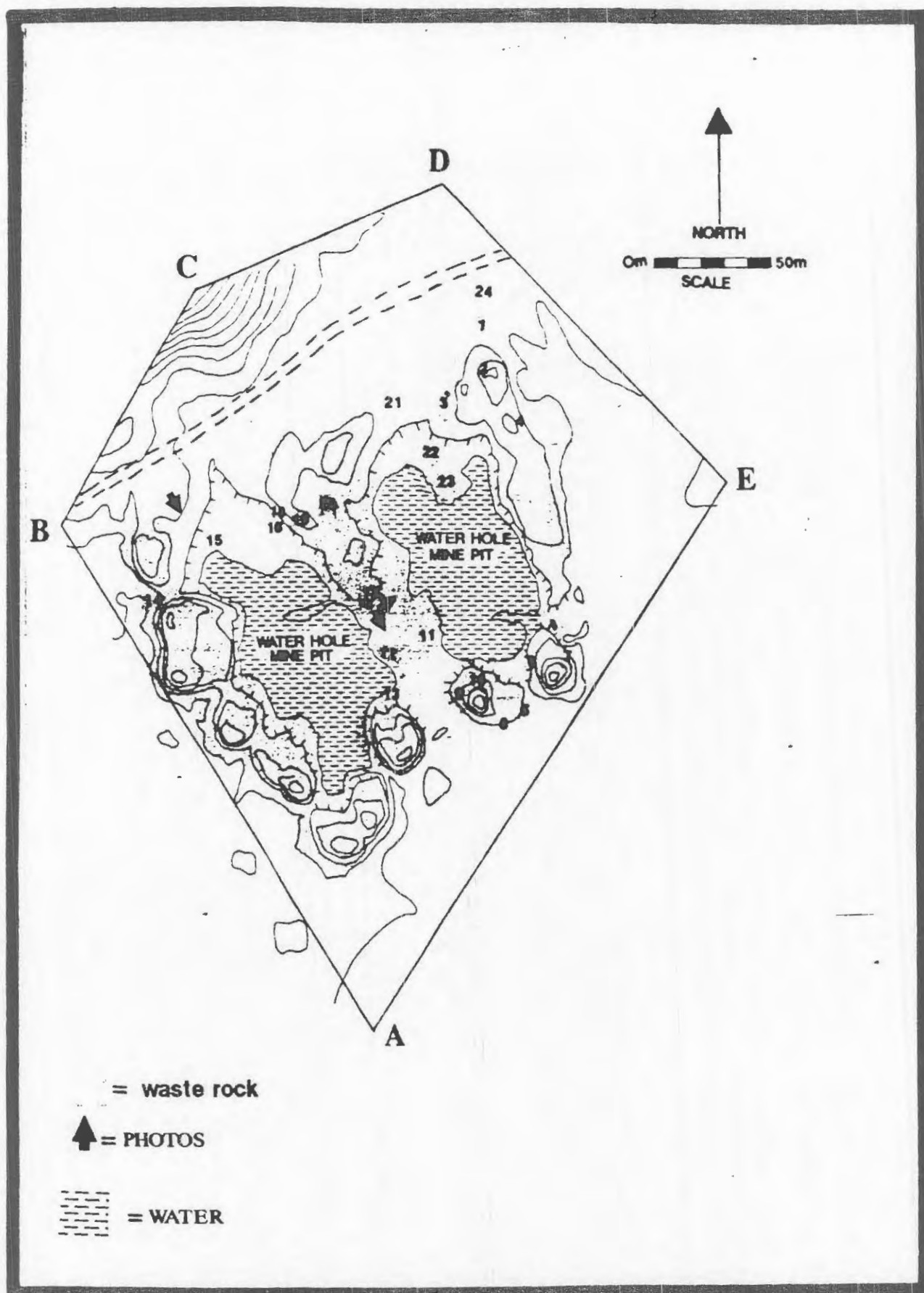


Figure 11. Specific Map Illustrating AZ-N-22-03 (NAMLRD # 74).

**Navajo Nation Archaeology Department**

### Site Survey and Management Form

SITE NO. :  
AZ-N-22-04

FIELD OR OTHER NAME: NAMLRD #75  
Ryan No. 2

DATE RECORDED:  
May 13-14, 1992

**PROJECT NUMBER & NAME:** NNAD 92-146, An Archaeological Survey for the Proposed Reclamation of 9 Abandoned Uranium Mines in Cameron, Coconino County, Arizona.

ORGANIZATION: NNAD-NAU

ARCHAEOLOGIST(S): Brady Two Bears,  
Davina Begaye

USGS 7.5' SERIES MAP REFERENCE: Wupatki NE, Arizona 1969

**LEGAL LOCATION:** T27N, R10E (projected) unplatted

UTM ZONE: 12,

CP A 3954140N, 473290E  
CP B 3954250N, 473100E  
CP C 3954440N, 473050E  
CP D 3954730N, 473300E  
CP E 3954740N, 473760E  
CP F 3954510N, 473890E

STATE: Arizona

COUNTY: Coconino

CHAPTER: Cameron

LAND STATUS: Navajo Tribal Trust

GROUND VISIBILITY: 90-100%

Kind and extent of cover? Low shrubs and grasses

**TOPOGRAPHY:** Flood plain

**DRAINAGE:** Unnamed ephemeral wash 200 m north

**ELEVATION (FT/M):** 4,260 ft./1,298 m      **Slope and Direction:** Variable

SOIL TYPE: Well sorted fine grained sand      OTHER: Tolchaco gravel

VEGETATION PRESENT: 2 wing saltbush, camelthorn, prickly pear, narrow leaf yucca, Russian thistle, tamarisk and various grasses.

CULTURAL AFFILIATION(S): Anglo

**SITE TYPE:** Uranium open pit mine

PERIOD(S) OF OCCUPATION (Date, if known): 1950s-60s      HOW DATED: Historic records

DIMENSIONS OF SITE (l x w): 3,090 ft./941 m x 1,648 ft./502 m      Total Area (sq. m):  
428,280 sq. m

**How Determined:** Compass and metric tape

ARCHITECTURE PRESENT? Describe: No

ARTIFACTS OBSERVED/COUNTED: See Site Description

COLLECTION MADE: No

OF WHAT? N/A

**METHOD:** N/A

<u>PHOTO TAKEN?</u>	<u>B/W:</u>	<u>Frame(s):</u>	<u>Color:</u>	<u>Roll:</u>	<u>Frame(s):</u>
Yes	N/A	N/A	Yes	undeveloped	N/A

SITE DESCRIPTION: Site consists of one large open ore pit mine measuring 73 ft. (22 m) deep, 2,472 ft. (753 m) long and 206 ft. (62 m) wide. Large waste ore/rock piles lie to the north and west of the open pit. This site is a rather large open ore pit mine that contained modern and historic trash. Items inventoried during survey include:

1. Bud Light aluminum can
2. cow skull
3. 5+ pieces of a broken bottle
4. old rusted can
5. cow hoof
6. 3 ft. heavy machinery piece
7. clear glass bottle
8. 7 ft. piece of black tubing
9. 3 ft. cable
10. 11 ft. cable
11. 1 ft. cable
12. 1 gal. smashed oil can
13. "Ormel" sausage can
14. orange plastic spray can
15. unopened aluminum can
16. 1" diameter embedded pipe
17. (3" diameter) 4 ft. long pipe
18. 1" diameter cable
19. 1" diameter cable
20. oil can
21. oil can
22. cardboard box
23. 3+ broken wooden stakes
24. oil can
25. rusted horse shoe
26. 1 ft. tangled cable
27. 60+ cable pieces
  - 12+ oil cans
  - 30 ft. cable
  - various tractor parts
  - 6 m tractor tread
  - 75 ft. +/- wire
  - 5 gal. oil can
  - fan
  - hoses
29. oil can
30. storage room structure w/ milled lumber gate(?)
  - Hines root beer bottle
31. rusted 5 gal. gas can
32. oil can
33. 2+ plywood
34. stake
35. 1 gal. oil can
36. metal piece
37. crushed/rusted metal can
38. strip of (100% cotton) long sleeve shirt
39. metal rusted can

40. picket sign

41. rusted can

Historical information was minimal, but a description of the ongoing work and dimensions of the mine were discussed in the mine inspection reports (McConnell March 28, 1957). This mine was operated by the Ryan Oil Corporation and produced 2,066 tons between 1956-58.

CONDITION OF SITE: Poor

Causes of disturbance: Erosion and littering

LOCATION OF SITE RELATIVE TO PROJECT AREA: Site is the project area

EXTENT OF INVESTIGATION TO DATE: This recording

RESEARCH POTENTIAL: None

RECOMMENDATIONS: Since this site is not Register eligible, we recommend that AMLRD proceed with their reclamation as planned.

SITE ASSESSMENT UNDER 36 CFR 60.4 (National Register):

INTEGRITY: Site contains integrity of location

and CRITERIA a-d: Site does not qualify under Criteria a-d and is not eligible for nomination to the National Register, as it lacks scientific research potential. Further investigation is unlikely to yield information important in local history.

EXCLUSIONS: Site is less than 50 years old.

SITE ASSESSMENT UNDER 43 CFR 7.3 (Archaeological Resources Protection Act):

Site is less than 100 years old and lacks scientific research potential, thus it is not protected under ARPA.

SITE ASSESSMENT UNDER AIRFA (American Indian Religious Freedom Act):

Site has no religious significance to extant Native Americans, thus does not merit protection under AIRFA.

PROVIDE A SITE MAP (including site designation, North arrow, scale, recognizable features, landmarks and relationship to project area).

HOW CAN SITE BE REACHED? (See attached U.S.G.S. map)

OTHER COMMENTS: None

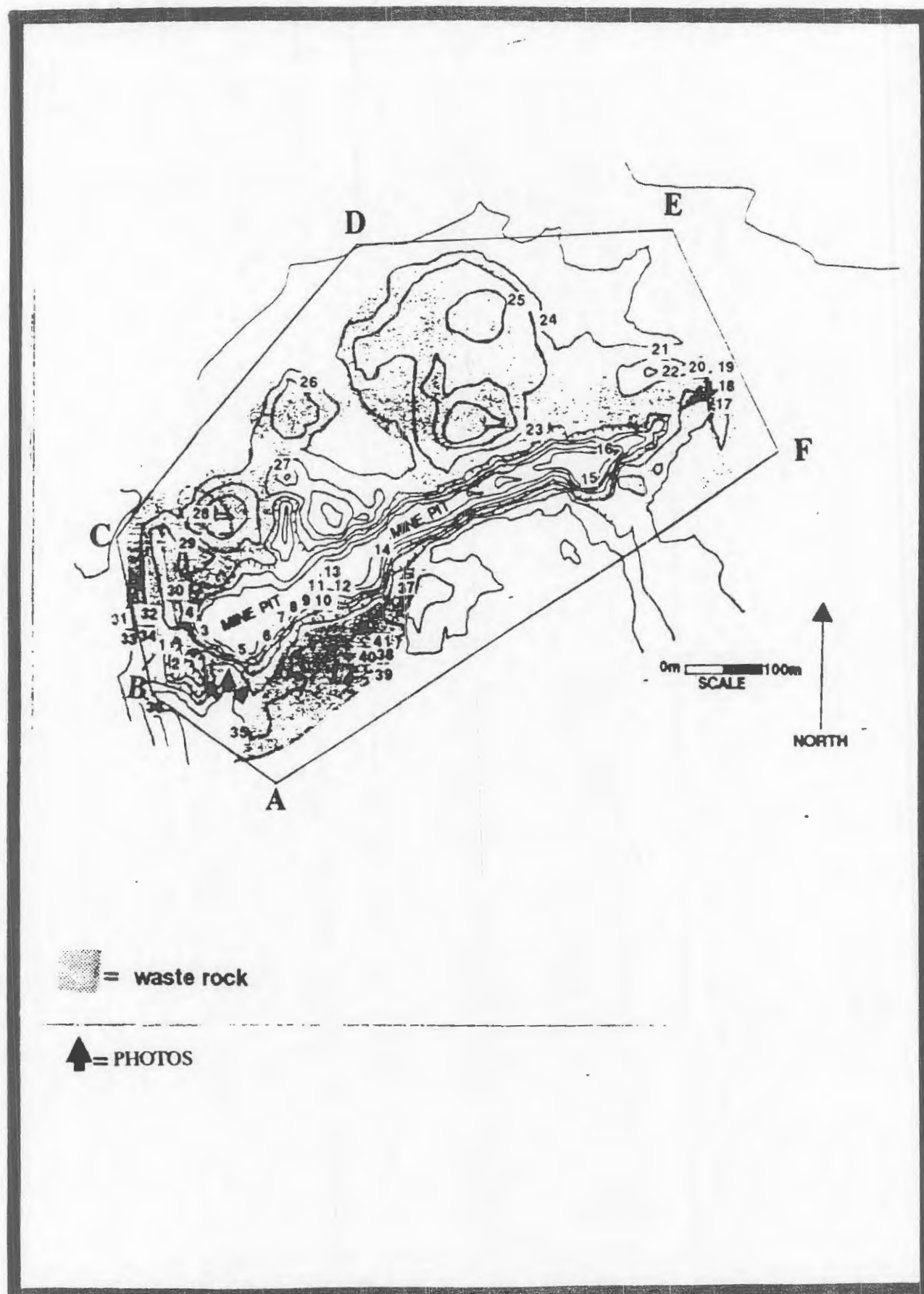


Figure 12. Specific Map Illustrating AZ-N-22-04 (NAMLRD # 75).

Navajo Nation Archaeology DepartmentSite Survey and Management FormSITE NO. :  
AZ-N-22-05FIELD OR OTHER NAME: NAMLRD #79  
Yazzie No. 1DATE RECORDED:  
May 4, 1992PROJECT NUMBER & NAME: NNAD 92-146, An Archaeological Survey for the Proposed Reclamation of 9 Abandoned Uranium Mines in Cameron, Coconino County, Arizona.ORGANIZATION: NNAD-NAUARCHAEOLOGIST(S): Brady Two Bears,  
Davina BegayeUSGS 7.5' SERIES MAP REFERENCE: Wupatki NE, Arizona 1969LEGAL LOCATION: T27N, R10E (projected) unplattedUTM ZONE: 12,CP A 3953190N, 472240E  
CP B 3953180N, 472200E  
CP C 3953140N, 472100E  
CP D 3953180N, 472040E  
CP E 3953400N, 472060E  
CP F 3953380N, 472140E  
CP G 3953250N, 472260ESTATE: ArizonaCOUNTY: CoconinoCHAPTER: CameronLAND STATUS: Navajo Tribal TrustGROUND VISIBILITY: 90-100%Kind and extent of cover? Low shrubs and grassesTOPOGRAPHY: Flood plainDRAINAGE: Little Colorado River 520 m westELEVATION (FT/M): 4,240 ft./1,292 mSlope and Direction: VariableSOIL TYPE: Well sorted fine grained sandOTHER: Tolchaco gravelVEGETATION PRESENT: 2 wing saltbush, camelthorn, prickly pear, narrow leaf yucca, cliff rose, sage, hairy cactus Russian thistle, tamarisk and various grasses.CULTURAL AFFILIATION(S): AngloSITE TYPE: Uranium open pit minePERIOD(S) OF OCCUPATION (Date, if known): 1950s-60sHOW DATED: Historic recordsDIMENSIONS OF SITE (l x w): 891 ft./271 m x 742 ft./226 mTotal Area (sq. m):  
31,930 sq. mHow Determined: Compass and metric tapeARCHITECTURE PRESENT? Describe: NoARTIFACTS OBSERVED/COUNTED: See Site DescriptionCOLLECTION MADE: NoOF WHAT? N/AMETHOD: N/A



<u>PHOTO TAKEN?</u>	<u>B/W:</u>	<u>Frame(s):</u>	<u>Color:</u>	<u>Roll:</u>	<u>Frame(s):</u>
Yes	N/A	N/A	Yes	undeveloped	N/A

SITE DESCRIPTION: The site consists of one major pit and associated waste ore/rock piles throughout the site. The main pit measures 30 ft. (9 m) deep, 297 ft. (90 m) in width, and 247 ft. (75 m) in length. Waste ore/rock piles are concentrated on the eastern edge of the pit, but a large waste ore/rock pile is situated (NE-SW) immediately adjacent to the main pit. The items inventoried during survey includes:

1. bottle of 7-Up (80s-90s)
2. 5 gal. rusted gas can
3. 5 gal. rusted barrel
4. 5 gal. rusted barrel
5. Budweiser can
6. 3-4 ft. long iron cable
7. 1 gal. antifreeze container
8. 2 ft. piece of milled lumber
9. 2 m diameter circle of broken glass
10. 2 ft. rusted metal flat piece

Historic information for this mine was obtained from mining inspection reports conducted throughout the 1950s and 1960s. The only report found mentions the following:

... is located about 18 miles south of the Cameron Bridge on the east side of the Little Colorado River. The mine is a strip pit about 200 ft. wide and 300 ft. long. Overburden averages about 30 ft. thick. The ore body varies from a thin section to 3 ft. thick (McConnell 1958 April 10).

This mine was operated by the Foley Brothers Inc. and produced 343 tons between 1956-57.

CONDITION OF SITE: Poor

Causes of disturbance: Erosion and littering

LOCATION OF SITE RELATIVE TO PROJECT AREA: Site is the project area

EXTENT OF INVESTIGATION TO DATE: This recording

RESEARCH POTENTIAL: None

RECOMMENDATIONS: Since this site is not Register eligible, we recommend that AMLRD proceed with their reclamation as planned.

SITE ASSESSMENT UNDER 36 CFR 60.4 (National Register):

INTEGRITY: Site contains integrity of location

and CRITERIA a-d: Site does not qualify under Criteria a-d and is not eligible for nomination to the National Register, as it lacks scientific research potential. Further investigation is unlikely to yield information important in local history.

EXCLUSIONS: Site is less than 50 years old.

SITE ASSESSMENT UNDER 43 CFR 7.3 (Archaeological Resources Protection Act):

Site is less than 100 years old and lacks scientific research potential, thus it is not protected under ARPA.

**SITE ASSESSMENT UNDER AIRFA (American Indian Religious Freedom Act):**

Site has no religious significance to extant Native Americans, thus does not merit protection under AIRFA.

**PROVIDE A SITE MAP** (including site designation, North arrow, scale, recognizable features, landmarks and relationship to project area).

**HOW CAN SITE BE REACHED?** (See attached U.S.G.S. map)

**OTHER COMMENTS:** None

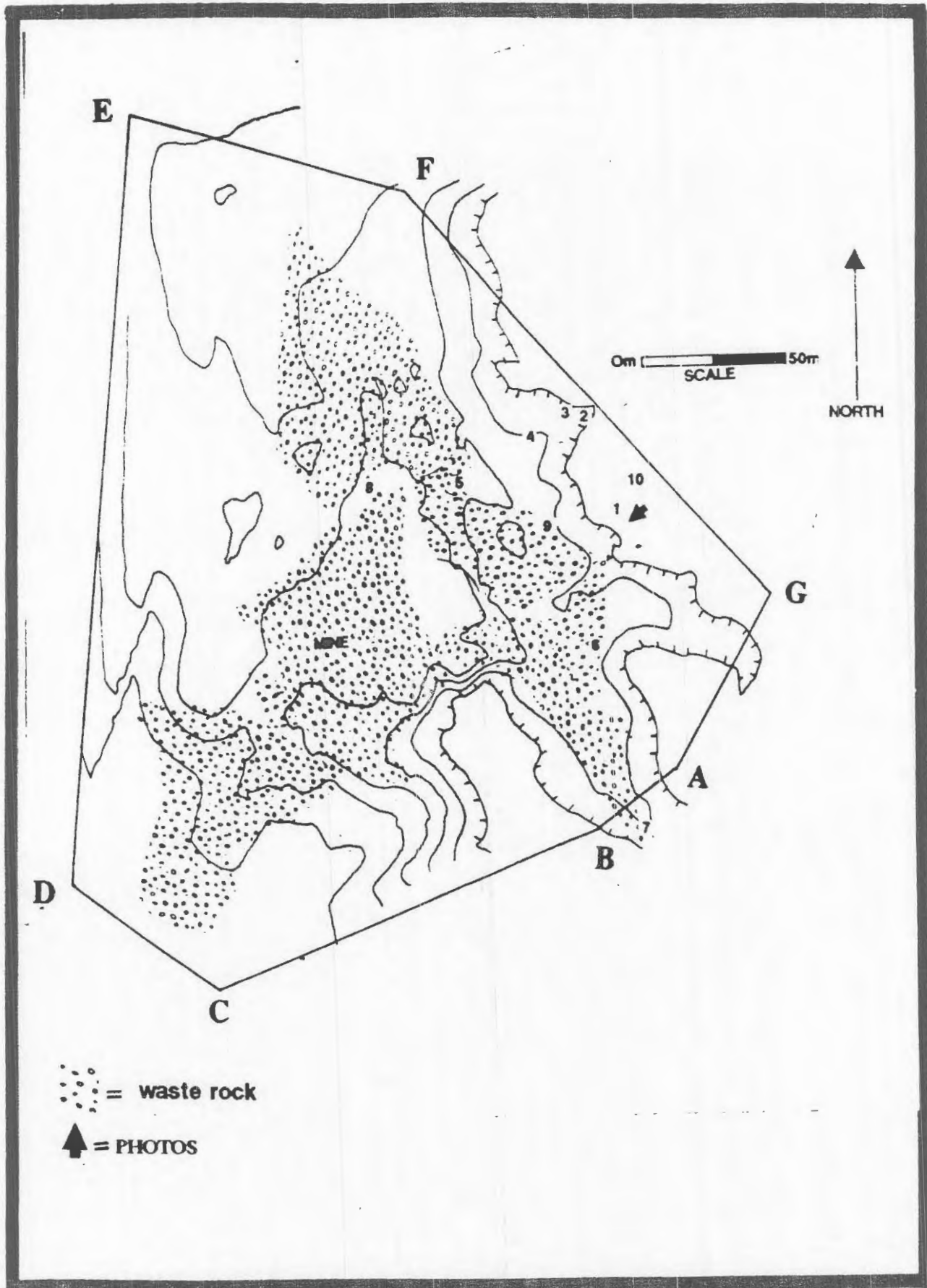


Figure 13. Specific Map Illustrating AZ-N-22-05 (NAMLRD # 79).

Navajo Nation Archaeology DepartmentSite Survey and Management FormSITE NO. :  
AZ-N-22-06FIELD OR OTHER NAME: NAMLRD #80  
Yazzie No. 2DATE RECORDED:  
May 14, 1992PROJECT NUMBER & NAME: NNAD 92-146, An Archaeological Survey for the Proposed Reclamation of 9 Abandoned Uranium Mines in Cameron, Coconino County, Arizona.ORGANIZATION: NNAD-NAUARCHAEOLOGIST(S): Brady Two Bears,  
Davina BegayeUSGS 7.5' SERIES MAP REFERENCE: Wupatki NE, Arizona 1969LEGAL LOCATION: T27N, R10E (projected) unplattedUTM ZONE: 12,CP A 3953000N, 472730E  
CP B 3952930N, 472350E  
CP C 3953200N, 472310E  
CP D 3953300N, 472480E  
CP E 3953390N, 472700ESTATE: ArizonaCOUNTY: CoconinoCHAPTER: CameronLAND STATUS: Navajo Tribal TrustGROUND VISIBILITY: 90-100%Kind and extent of cover? Low shrubs and grassesTOPOGRAPHY: Flood plainDRAINAGE: Little Colorado River 840 m westELEVATION (FT/M): 4,300 ft./1,310 mSlope and Direction: VariableSOIL TYPE: Well sorted fine grained sandOTHER: Tolchaco gravelVEGETATION PRESENT: 2 wing saltbush, camelthorn, prickly pear, narrow leaf yucca, Russian thistle, tamarisk and various grasses.CULTURAL AFFILIATION(S): AngloSITE TYPE: Uranium open pit minePERIOD(S) OF OCCUPATION (Date, if known): 1950s-60sHOW DATED: Historic recordsDIMENSIONS OF SITE (l x w): 1,992 ft./607 m x 1,286 ft./391 mTotal Area (sq. m):  
131,918 sq. mHow Determined: Compass and metric tapeARCHITECTURE PRESENT? Describe: NoARTIFACTS OBSERVED/COUNTED: See Site DescriptionCOLLECTION MADE: NoOF WHAT? N/AMETHOD: N/A

<u>PHOTO TAKEN?</u>	<u>B/W:</u>	<u>Frame(s):</u>	<u>Color:</u>	<u>Roll:</u>	<u>Frame(s):</u>
Yes	N/A	N/A	Yes	undeveloped	N/A

SITE DESCRIPTION: This site consists of a main pit and extensive waste ore/rock scattered throughout the project area. A main road transects the project area on the eastern portion as well as waste ore/rock. The main pit measures 415 ft. (126 m) in length and 166 ft. (56 m) in width. A major waste ore/rock pile is situated adjacent to the intersecting graded road and measures 996 ft. (305 m) long and 249 ft. (75 m) wide. The other major waste ore/rock pile lies 106 ft. (50 m) west of the main pit and is 747 ft. (227 m) long and 498 ft. (151 m) in width. Items inventoried during survey include:

1. 5 gal. oil can
2. clear glass fragments
3. aerosol can
4. aluminum can
5. 2 ft. steel cable
6. pop bottle
7. stake
  - 2 oil cans
8. glass fragments
9. circular metal
10. machinery metal
11. broken glass
  - plywood
  - rain boots
12. Budweiser can
13. wooden stake
14. metal teeth for machinery
15. crushed Budweiser can
16. Coors can
17. baling wire
18. crushed/rusted oil can
19. 1 ft. wire
20. rusted oil can (SAE 40 HD)
22. 3 rusted oil cans
24. coffee can (Farne Brother Fine Quality Coffee)
26. milled lumber
28. aluminum scrap metal

Historical information documented was found in only one report:

...the strip pit is about 400 ft. square. Overburden is about 35 feet thick. Additional stripping since the last examination has sloped the high walls on about a 1 to 1 ratio. The ore is up to 5 ft. thick and at the time of examination a log about 16 inches in diameter had been uncovered over a distance of 32 ft. in the bottom of the pit. The log was the same diameter over the entire distance and the butt or top end could not be determined (McConnell April 10, 1958).

This mine was operated by the Foley Brothers Inc. and produced 5,646 tons between 1957-61.

CONDITION OF SITE: Poor

Causes of disturbance: Erosion and littering

LOCATION OF SITE RELATIVE TO PROJECT AREA: Site is the project area

EXTENT OF INVESTIGATION TO DATE: This recording

RESEARCH POTENTIAL: None

RECOMMENDATIONS: Since this site is not Register eligible, we recommend that AMLRD proceed with their reclamation as planned.

SITE ASSESSMENT UNDER 36 CFR 60.4 (National Register):

INTEGRITY: Site contains integrity of location

and CRITERIA a-d: Site does not qualify under Criteria a-d and is not eligible for nomination to the National Register, as it lacks scientific research potential. Further investigation is unlikely to yield information important in local history.

EXCLUSIONS: Site is less than 50 years old.

SITE ASSESSMENT UNDER 43 CFR 7.3 (Archaeological Resources Protection Act):

Site is less than 100 years old and lacks scientific research potential, thus it is not protected under ARPA.

SITE ASSESSMENT UNDER AIRFA (American Indian Religious Freedom Act):

Site has no religious significance to extant Native Americans, thus does not merit protection under AIRFA.

PROVIDE A SITE MAP (including site designation, North arrow, scale, recognizable features, landmarks and relationship to project area).

HOW CAN SITE BE REACHED? (See attached U.S.G.S. map)

OTHER COMMENTS: None



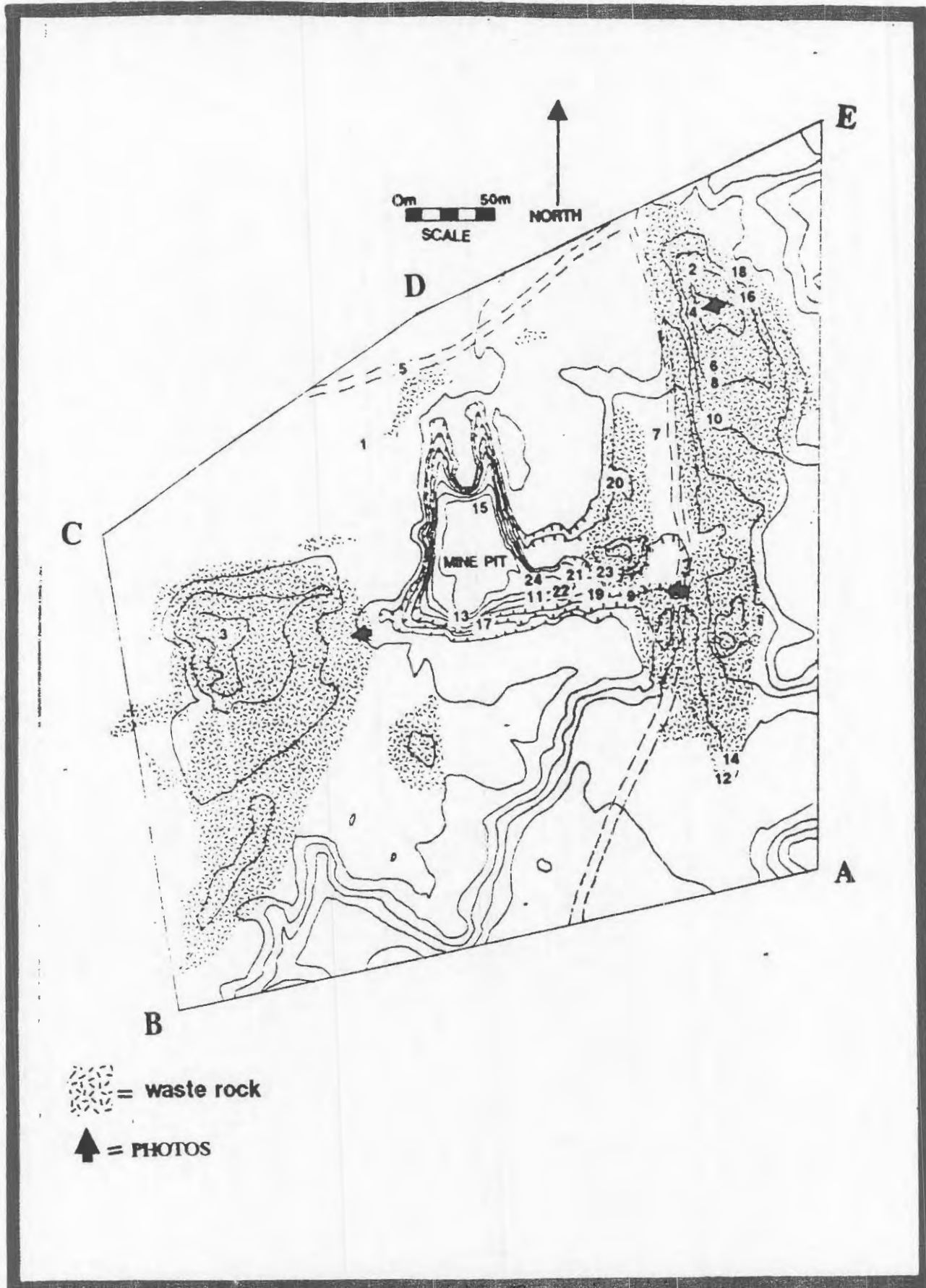


Figure 14. Specific Map Illustrating AZ-N-22-06 (NAMLRD # 80).

## APPENDIX B